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United States
Department of
Agriculture

Forest Service
Flathead
National Forest

Environmental Impact Statement
Vol II

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Forest Plan Flathead National Forest December 1985

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ENVIRONMENTAL IMPACT STATEMENT
for
THE FLATHEAD NATIONAL FOREST
LAND AND RESOURCE MANAGEMENT PLAN

VOLUME II

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APPENDIX A

IDENTIFICATION OF ISSUES, CONCERNS, AND OPPORTUNITIES

A. PROCESS

The Notice of Intent to prepare a Forest Plan and Environmental Impact Statement was published in the Federal Register 9963 - February 1980.

The interdisciplinary team began its identification of public issues by reviewing public comments from a series of listening sessions held in 1971, 11 Unit Plans completed in the 1970's, and the results of three appeals and injunctions. Also reviewed were internal issues called management concerns, identified by Flathead National Forest personnel. In January 1980, a list of tentative issues based on past public involvement were included in a series of Forest Plan Progress Reports. In addition, one In-Service and five public workshops were held in January 1980 to identify issues and concerns. Public responses to the Progress Report and at the workshops resulted in about 200 issue statements. The interdisciplinary team grouped these statements into like categories and used this involvement to revise and update the tentative list of issues and management concerns to be brought forward and addressed in the Forest Plan.

The team members also made recommendations as to how they believed the issues/concerns should be mainly resolved. The three basic strategies included:

1. It will be resolved by management direction (policy changes).
2. It will be resolved by at least one and maybe several alternatives responsive to it (designation).
3. It will be resolved by a certain level of outputs or effects that result from the Preferred Alternative in the Forest Plan.

Comments from private landowners having intermingled ownership in, or are dependent for access upon, Flathead National Forest lands, were sought starting in October 1980.

The Notice of Availability of the DEIS and Proposed Forest Plan appeared in the Federal Register 9365 - March 4, 1983, showing that the review period would end June 5, 1983.

Notices extending the review period appeared in the Federal Register as follows:

24753 - June 2, 1983, extending to July 20, 1983 and
33330 - July 20, 1983, extending to August 10, 1983.

During the review period meetings were held with individuals, groups, organizations, and the general public to discuss the documents. A listing of public involvement meetings is displayed below.

Additional public involvement was initiated in September 1983 to aid in resolution of the roadless designation question. Prior to this, Forest planning efforts had examined a broad range of uses for roadless areas but had not included an evaluation for wilderness designation. The Forest had relied on earlier evaluations and recommendations made in the RARE II (Roadless Area Review and Evaluation) final EIS. As a result of the Ninth Circuit Court decision on the RARE II EIS, the Forest included an evaluation of roadless areas for wilderness in the Forest planning process. An in-house review of the roadless land inventory on the Flathead National Forest began and the process of studying these roadless areas for wilderness potential was set in motion. Members of the public who expressed an interest in the Forest planning process were sent mailers and two public information meetings were held. Public input regarding the updated roadless boundaries was solicited, resulting in some further boundary adjustments in the Hall Creek area of the Swan Front and the Kootenai National Forest portion of the Le Beau Area. Public comments to the mailer and management concerns were reviewed by the Interdisciplinary Team, resulting in additions to the list of issues and concerns addressed in the DEIS.

Comments received on the original DEIS were considered and are addressed in the final EIS.

Public comment was not solicited regarding the grizzly bear guidelines. It is addressed as a management concern relative to Regional direction. The Forest Management Team learned the U.S. Fish and Wildlife Service was considering issuing a jeopardy opinion on the DEIS and Proposed Forest Plan, due to the lack of specific management guidelines for all occupied grizzly bear habitat. Because current Forest-wide grizzly bear management practices were already in effect, and were in all probability aiding in achieving a recovered population, those management practices were not specified in the DEIS. The grizzly bear guidelines are now integrated into the Forest Plan.

All the issues and concerns identified in the original DEIS are addressed as well as two additional issues which surfaced during the public comment period.

- -- Which roadless areas or parts of roadless areas should be recommended for wilderness?
- -- How can the Forest deal with the public's concern that the necessary funding for monitoring and implementation of the Forest Plan may not be forthcoming?

To gain a full understanding of the public's viewpoint, one of the issues, "What type of management is appropriate for roadless and undeveloped areas in Flathead National Forest?" was restated and comments were asked for in the public response forms. This issue was restated as, "How should the areas not recommended for wilderness be managed?"

Notice of Availability of the DEIS Supplement and Forest Plan Supplement appeared in the Federal Register 45486 - November 16, 1984, showing the public review period to end February 15, 1985. A notice extending the review period to March 15, 1985, appeared in the Federal Register 5409 - February 8, 1985.

SUMMARY OF PUBLIC MEETINGS

January 16, 1980 - Kalispell, Public Attendance -
- public workshop to identify issues and concerns.

January 22, 1980 - Columbia Falls
- public workshop to identify issues and,concerns.

January 23, 1980 - Whitefish
- public workshop to identify issues and concerns.

January 24, 1980 - Kalispell
- public workshop to identify issues and concerns.

January 28, 1980 - Bigfork
- public workshop to identify issues and concerns.

September 27, 1980 - Kalispell
- alternative formulation workshop

January 9, 1982 - Condon
- meeting with citizens from the Swan Valley and adjacent communities to provide information on Forest management practices and the procedures used in preparing the Forest Plan.

November 3, 1982
- meeting to present overview of oil and gas situation of the Flathead National Forest.

April 12, 1983 - Condon
- meeting to discuss the Proposed Forest Plan.

April 18, 1983 - Bigfork
- meeting to discuss the Proposed Forest Plan.

April 20, 1983 - Columbia Falls
- meeting to discuss the Proposed Forest Plan.

April 26, 1983 - Missoula
- meeting to discuss the Proposed Forest Plan.

April 28, 1983 - Whitefish
- meeting to discuss the Proposed Forest Plan.

May 3, 1983 - Yellow Bay
- meeting to discuss the Proposed Forest Plan.

May 4, 1983 - Kalispell
- meeting to discuss the Proposed Forest Plan.

May 9, 1983 - Polson
- meeting to discuss the Proposed Forest Plan.

May 11, 1983 - Swan Lake
- meeting to discuss the Proposed Forest Plan.

May 18, 1983 - Swan Valley
- field review to discuss the Proposed Forest Plan.

May 20, 1983 - Whale Creek
- field review to discuss the Proposed Forest Plan.

September 19, 1983
- meeting regarding the roadless area information and inventory on the Forest.

September 27, 1983
- meeting regarding the roadless area information and inventory on the Forest.

April 26, 1984
- meeting to discuss management of the Swan Range between Lake Blaine and Ferndale.

January 7, 1985 - Columbia Falls
- meeting to discuss DEIS & Proposed Forest Plan Supplements. (19)

January 10, 1985 - Missoula
- meeting to discuss DEIS & Proposed Forest Plan Supplements. (15)

January 15, 1985 - Kalispell FVCC
- meeting to discuss DEIS & Proposed Forest Plan Supplements. (9)

January 16, 1985 - Whale Creek, North Fork
- meeting to discuss DEIS & Proposed Forest Plan Supplements. (16)

January 21, 1985 - Creston
- meeting to discuss DEIS & Proposed Forest Plan Supplements. (54)

January 22, 1985 - Bigfork
- meeting to discuss DEIS & Proposed Forest Plan Supplements. (31)

January 28, 1985 - Whitefish
- meeting to discuss DEIS & Proposed Forest Plan Supplements. (70)

February 5, 1985 - Condon
- meeting to discuss DEIS & Proposed Forest Plan Supplements. (27)

February 6, 1985 - Kalispell
- meeting to discuss DEIS & Proposed Forest Plan Supplements. (138)

B. CONSULTATION WITH OTHERS

1. FEDERAL, STATE, AND LOCAL AGENCIES; INDIAN TRIBES; AND OTHERS

a. Contacts

To the degree possible, Flathead National Forest personnel have coordinated this Forest planning effort with Federal, State and local agencies, Indian tribes, and other public organizations (CFR 219.7).

(1) Federal Agencies

Interagency Archeological Services,
Feb. 28, 1980
- letter containing their recommendations regarding the handling of prehistoric and historic cultural resources within the Forest Plan.

Bonneville Power Administration,
June 9, 1980
- phone conversation in response to Progress Report #1, reinforcing corridor concept with Regional Plan and the tie to the Forest Plan.

August 8, 1980
- phone conversation discussing the coordination of BPA and Flathead National Forest actions with the Kalispell District Office.

Environmental Protection Agency,
January 31, 1985 - Steve Potts, U.S. EPA, Helena, MT
- phone conversation about water quality monitoring as described in the Forest Plan (1)

February 14, 1985 - Steve Potts, U.S. EPA, Helena, MT
- phone conversation to discuss his concerns about water quality monitoring as described in the Forest Plan (1).

March 4, 1985
- meeting to discuss DEIS & Proposed Forest Plan Supplements, specifically in regards to the handling of water quality on the Forest (13).

USDI - Bureau of Indian Affairs,
August 6, 1980
- meeting to discuss agency concerns for the Mission Mountain Wilderness, rights-of-way, road closures, and cultural resources.

August 27, 1980
- meeting to identify cultural sites on Flathead National Forest.

June 1, 1981
- joint meeting with Fish and Wildlife Service, Flathead National Forest and the Park Service to discuss how grizzly bear habitat will be handled in the Forest Plan.

February 1, 1985 - Bob Clawer, BIA
- inquiry about which documents were currently being reviewed (1). phone

February 5, 1985 - Martin Gulick, BIA, Pablo
- asked about transportation planning and transportation plan for the Forest (1). phone

USDI - Fish and Wildlife Service,
June 1, 1981
- joint meeting with the Park Service, the Bureau of Indian Affairs and Flathead National Forest to

discuss how grizzly bear habitat will be handled in the Forest Plan.

May 25, 1983
- meeting to discuss the application of the Yellowstone Guidelines on the National forests.

December 13, 1984
- meeting with Wayne Brewster and Dale Harmes to discuss grizzly bear guidelines and the effect they will have on timber harvest volumes (2).

March 5 & 6, 1985
- meeting to discuss grizzly bear situation designation and management guidelines on the Forest. Included Fish and Wildlife Service, Glacier National Park, Border Grizzly Project, Flathead National Forest, and Timber Industry representatives (60).

USDI - National Park Service - Glacier National Park,

June 1, 1981
- joint meeting with the Fish and Wildlife Service, the Bureau of Indian Affairs, and Flathead National Forest to discuss how grizzly bear habitat will be handled in the Forest Plan.

April 14, 1982
- meeting to discuss park concerns regarding winter range, wildlife travel corridors, wildlife designations, fire, view points from the park, and air quality.

May 16, 1983
- meeting to discuss park concerns regarding timber programming, monitoring and VQO's.

February 21, 1985
- meeting to discuss DEIS & Proposed Forest Plan Supplements (19).

(2) State of Montana Agencies

State Lands Department - State Forestry Division,

January 6, 1981
- meeting to discuss coordination of management activities with Burlington Northern and Flathead National Forest regarding the water resource.

February 27, 1981
- briefing on IFP progress and to establish the need and means for future coordination between agencies.

Department of Fish, Wildlife, and Parks,

January 6, 1981
- meeting to develop general guidelines for big-game winter forage production.

June 1, 1981
- joint meeting with the Bureau of Indian Affairs, National Parks Service and the Flathead National Forest to discuss how grizzly bear habitat will be handled in the Forest Plan.

September 20, 1982
- meeting to discuss the Kootenai National Forest and Flathead National Forest plans as related to wildlife and fish. Major discussion centered around road closures, restrictions and proposed access thru road construction over time.

January 13, 1983
- meeting to review criteria used in analysis of the grizzly bear, whitetail deer winter range, and mule deer/elk winter range. Also outlined the Forest Plan for Glen Erikson who represented the Governor's committee. Erikson reviewed the committee's process.

March 4, 1985
- meeting to discuss DEIS & Proposed Forest Plan Supplements, specifically in regards to the handling of water quality on the Forest (13).

April 15, 1983
- meeting held to review the Department's comments on the Proposed Flathead Forest Plan.

February 2, 1984 - coordination meeting.

February 5, 1985
- meeting to discuss DEIS & Proposed Forest Plan Supplements (2).

Governor's Office,

March 11, 1983
- meeting to present the Proposed Forest Plan to the State Planning Task Force.

April 5, 1983
- resource potential maps requested at 3/11/83 meeting were sent.

April 13, 1983
- meeting with the Governor's Natural Resources Committee to discuss the Proposed Forest Plan.

January 10, 1984
- meeting with State Planning Task Force to discuss the Forest's roadless area analysis.

December 12, 1985
- meeting with Governor's Forest Planning Task Force to discuss DEIS and Proposed Forest Plan Supplements (12).

January 23, 1985
- meeting with Governor's Ad Hoc Committee on Forest Resources to discuss DEIS and Proposed Forest Plan Supplements (31).

State Historic Preservation Office,

April 8, 1982
- phone conversation concerning cultural resource input on the Proposed Forest Plan.

Montana Water Quality Bureau, Dept. of Health and Environmental Sciences,

March 4, 1985

- meeting to discuss DEIS & Proposed Forest Plan Supplements, specifically in regards to the handling of water quality on the Forest (13).

(3) Local Government Agencies

Flathead County Advisory Technical Staff,

November 13, 1980

- meeting with Nakul Verma to discuss coordination on subdivision reviews of lands within the Forest and soils information.

November 20, 1980

- followup meeting to agree on coordination procedures.

Flathead River Basin Study Steering Committee,

May 9, 1980

- meeting to discuss date base with regards to the Flathead Basin EIS.

March 14, 1983

- meeting to present the Proposed Forest Plan.

November 14, 1984

- meeting to discuss DEIS & Proposed Forest Plan Supplements.

Flathead Soil Conservation District, Board of Supervisors

March 14, 1983

- meeting to present the Proposed Forest Plan.

Lake County Rural Development Committee

May 4, 1983

- meeting to present the Proposed Forest Plan.

(4) Indian Tribes

Confederated Salish - Kootenai Tribes

August 27, 1980

- meeting with the Cultural Committee to discuss and exchange of information about prehistoric and historic sites on the Flathead National Forest lands that may be significant to tribal members.

February 4, 1981

- meeting with land committee of the Salish - Kootenai Tribal Council to discuss the Draft Regional Plan and progress on the Flathead National Forest Plan and the need for coordination between agencies.

May 3, 1983

- meeting to discuss the Proposed Forest Plan.

February 12, 1985

- meeting with Cultural Committee to discuss procedures for reviewing Forest Service management plans and projects that potentially may have adverse or undesirable effects on areas of religious significance to the tribes.

March 8, 1985
- meeting to discuss DEIS & Proposed Forest Plan Supplements (30).

Blackfeet Tribe

March 13, 1985
- meeting with Land Committee members to discuss DEIS & Proposed Forest Plan Supplements (8).

(5) Other Agencies

British Columbia (Canada) Forest Service

January 21, 1981
- meeting to review the proposed activities north of the border within the North Fork of the Flathead River drainage.

b. Review of Plans

As part of the coordination process, Flathead National Forest personnel reviewed other agencies' planning and land use policies to identify potential conflicts between their objectives and those of Flathead National Forest. Documentation of this review is included in the Forest planning records. No conflicts were identified that needed to be mitigated through planning alternatives. Following are summaries of these reviews:

Flathead County, Flathead County Comprehensive Plan,
- Consider their concern involving disposal of waste into the air in the Swan Planning Unit along the east shore of Flathead Lake when planning our slash burning in the fall.
- Evaluate land designations in the Haskill Basin area northeast of Whitefish for effects on the community water supply.

Flathead Indian Reservation, Forest Management Plan, 1972-1981,
- Management Units adjacent to Flathead National Forest lands will have regulated road spacing and logging methods to reduce and minimize visual impacts of logging.

Lake County, Draft Comprehensive Plan for Lake County, May 1979,
- Recognizes the lifestyle and standard of living cherished by local residents.
- Issues:
  - Quality of water resources is the most important concern.
  - Protection of primary timber management areas is another concern.

  (Plan was dropped as of 10/16/80 due to public opposition.)

Missoula County, Missoula County Comprehensive Plan, 1975,
- The plan recognizes the role that natural resources play in the lifestyle of Missoula County residents.

Montana Department of Fish, Wildlife, and Parks, 1978 Montana State-wide Comprehensive Outdoor Recreation Plan,

- Sets harvest goals for elk, mule deer, bighorn sheep, moose, and mountain goat. Outlines strategies for managing habitat for these species, including:
  - Road closures, walk-in hunting areas.
  - Use of cooperative elk-logging study recommendations when planning timber sales.
  - Build minimum number of roads.

Montana Department of Natural Resources and Conservation, Final EIS Swan River State Forest Management Plan, July 1978,

- States objectives that emphasize active coordination with other agencies and adjacent land owners.
- Maintain diverse fisheries habitat through a coordinated management plan.
- Manage the Swan Highway corridor to maintain a general mature stand of timber while providing a diversity of foreground and background viewing opportunities.
  - Consider cooperative grazing arrangements.
  - Participate in cooperative watershed management practices.
  - Maintain the existing diversity of wildlife habitat and develop needed wildlife management information.

SCS, ERS, FS, MDNRC, Clark Fork of the Columbia River Basin Study, 1977,

- Respond to public recreation facility needs.
- Improve production efficiency of commercial timberland.
- Protect riparian vegetation.

USDI, Bureau of Land Management, State Director Guidance for Resource Management Planning in Montana and the Dakotas, 1981,

- Corridor planning guidelines are compatible with those in Regional Plan.
- BLM's plans will be consistent with plans of State and local governments and other Federal agencies to the extent the Secretary finds consistent with Federal law.
- Consider possible cooperative program (to gain access) in interagency rivers and other water bodies management. BLM's role is to cooperate and coordinate with the Montana Department of Fish, Wildlife, and Parks in assisting them to meet their SCORP (1978) objectives.

USDI, Bureau of Mines,

- MILS (Minerals Industry Locations System) analysis with maps available.

USDI, Fish and Wildlife Service, Jack D. Larmoyeaux, Acting Area Manager, Billings Area Office,

- Included documents:
  - Endangered Species Act of 1973 (as amended).
  - Interagency Cooperation.
  - Guidelines for Section 7 consultations.

USDI, Fish and Wildlife Service, Circular 39, Wetlands of the United States,
- Considering the riparian prescriptions, standards and guidelines for wetlands protection, the Plan should not conflict in principle or practice with FWS's concern for preservation of the Nation's wetlands.
- Look at the potential effects of the decrease in wildlife habitat on private land and changes in land use (agricultural to urban) which would cause a change in part of the Forest's clientele.

USDI, Glacier National Park Resource Management Plan, 1977,
- Potential for sharing research data on fire, insects and disease, and native plant culturing.

2. OTHER CONSULTATIONS

The following organizations, businesses, individuals, media, In-Service people and others have been kept informed through a series of planning "Progress Reports", and all have received copies of the DEIS and Proposed Forest Plan. In addition, many of these agencies and organizations have corresponded directly with Forest Service personnel. Meetings have been held when necessary and are documented in the Forest planning records. Where possible, the needs and concerns of these agencies and organizations have been addressed in this planning process. In some cases, the needs or concerns have been referred to other Forest units for more appropriate resolution.

a. Timber Industry

February 7, 1980 - Plum Creek Timber Co., Inc.
- meeting to discuss the resource items needed from the company for management situation analysis.

May 29, 1980 - Plum Creek Timber Co., Inc.
- meeting to familiarize the company with the data base.

November 7, 1980 - Western Wood Products Assoc.
- phone conversation regarding information for industry newsletter and to set up meeting to review timber analysis data.

December 5, 1980 - Plum Creek Timber Co., Inc.
- meeting to discuss the Forest Plan in relation to the Plum Creek Timber Co., Inc. land in the Swan Valley.

December 17, 1980 - IFRC, Plum Creek Timber Co., Inc., F.H. Stoltze Land & Lumber Co.
- Coordination meeting on timber analysis in the Forest Plan.

January 6, 1981 - Plum Creek Timber Co., Inc.
- meeting to discuss coordination of management activities with Plum Creek and State Forestry regarding the water resource on the Flathead National Forest.

January 28 & 29, 1981 - IFRC, Plum Creek Timber Co., Inc., F.H. Stoltze Land & Lumber Co.
- meeting to exchange information on timber data and analysis in the FORPLAN model.

June 1, 1982 - IFRC, Plum Creek Timber Co., Inc., Champion International Corp.
- meeting to discuss departure analysis needs and review the analysis of the manaing to discuss the Proposed Forest Plan.

March 18, 1983 - Plum Creek Timber Co., Inc.
- phone conversation regarding RARE II EIS invalidation by the 9th circuit court.

March 21, 1983 - Plum Creek Timber Co., Inc.
- meeting to discuss the Proposed Forest Plan.

April 5, 1983 - IFRC, Montana Logging Assoc., Louisiana Pacific Corp., Pyramid Mountain Lumber, Inc., Plum Creek Timber Co., Inc., F.H. Stoltze Land & Lumber Co., Champion International Corpl, American Timber Co., Forestry Enterprizes, Flathead Lumber Co.
- meeting to discuss timber harvest levels, watersheds, wildlife, roads, and economics in the Proposed Forest Plan.

April 15, 1983 - F.H. Stoltze Land & Lumber Co., Louisiana Pacific Corp.
- meeting to discuss comments on the Proposed Forest Plan.

April 22, 1983 - F.H. Stoltze Land & Lumber Co.
- information on wildlife and recreation analysis for the Proposed Forest Plan was given out.

April 27, 1983 - Champion International Corp., Plum Creek Timber Co., Inc.
- meeting to discuss the sediment production, water yield, and oil productivity facets of the Forest Plan.

April 28, 1983
- meeting with timber industry in Missoula to present the Proposed Forest Plan.

May 4, 1983 - Champion International Corp.
- information regarding estimated sediment loads delivered to streams from proposed management activities was given out.

May 17, 1983 - St. Regis Paper Co., Champion International Corp.
- meeting to explain yield tables used in FORPLAN.

April 14, 1984 - St. Regis Paper Co.
- phone conversation regarding information from the Forest Plan.

January 11, 1985 - Inland Forest Resource Council
- meeting to discuss DEIS & Proposed Forest Plan Supplements with Wayne Ludeman (1).

January 17, 1985 - Women in Timber
- meeting to discuss DEIS & Proposed Forest Plan Supplements (17).

March 9, 1985 - Loggers and Related Businessmen
- meeting for industry to relate their concerns to the Forest Service and for the Forest Service to discuss DEIS and Proposed Forest Plan Supplement (550).

March 12, 1985 - IFRC and Other Timber Leaders
- meeting to listen to industry concerns regarding timber volume to be harvested on the Forest (12).

b. **Conservation and Environmental Groups**

January 22, 1981 - Montana Wilderness Assoc.
- meeting to discuss Regional planning and Forest planning in regards to the treatment of roadless areas, oil and gas, wildlife, and wilderness in the Forest Plan.

November 10, 1981 - Montana Wilderness Assoc. and local citizens
- meeting to discuss the planning process.

February 23, 1982 - local citizens group
- meeting to discuss formulation of Alternative 5.

April 20, 1982 - Montana Wilderness Assoc. and local citizens groups
- meeting to discuss the development of the citizen's Alternative 5.

January 18, 1983 - Montana Wilderness Assoc.
- meeting with Forest Supervisor to discuss DEIS and Proposed Forest Plan.

March 10, 1983 - Flathead Wildlife
- meeting to discuss the Flathead National Forest's game management in the Proposed Forest Plan.

March 24, 1983 - Montana Wilderness Association
- meeting to discuss the Proposed Forest Plan.

April 11, 1983 - Audubon Society
- meeting to discuss the Proposed Forest Plan.

April 19, 1983 - Environmental Information Council
- meeting to discuss the Proposed Forest Plan.

April 24, 1983 - Northern Continental Conservation Committee
- meeting to discuss the Proposed Forest Plan.

April 27, 1983 - Flathead Wildlife
- meeting to discuss the Proposed Forest Plan.

December 13, 1985 - Flathead Wildlife Inc.
- meeting to discuss DEIS & Proposed Forest Plan Supplements (13).

January 17, 1985 - Montana Wilderness Association
- meeting to discuss DEIS & Proposed Forest Plan Supplements (38) [60].

c. **Educational Institutions**

September 18, 1980 - University of Montana, Faculty
- meeting to share information and discuss the Forest planning process regarding the data base and the use of linear program.

April 26, 1983 - University of Montana
- seminar to present the Forest's planning process to the School of Forestry faculty and graduate students.

December 10, 1984 - Wash. St. Univ. Forestry/Range Grad. class
- meeting to hear students' evaluation of review of the DEIS and Proposed Forest Plan (10).

January 10, 1985 - University of Montana
- meeting to discuss DEIS & Proposed Forest Plan Supplements (21).

February 11, 1985 - Flathead Valley Community College
- meeting to discuss DEIS & Proposed Forest Plan Supplements (27).

d. **Interest Groups and Associations**

March 16, 1983 - League of Women Voters
- meeting to discuss the Proposed Forest Plan.

March 17, 1983 - Women in Timber
- meeting to discuss the Proposed Forest Plan.

March 17, 1983 - Society of American Foresters
- meeting to discuss the Proposed Forest Plan.

March 17, 1983 - Columbia Falls Kiwanis
- meeting to discuss the Proposed Forest Plan.

March 21, 1983 - Whitefish Rotary
- meeting to discuss the Proposed Forest Plan.

March 29, 1983 - Cut Bank Snogoers
- meeting to discuss the Proposed Forest Plan.

April 13, 1983 - Flathead Back Country Horsemen
- meeting to discuss the Proposed Forest Plan.

April 19, 1983 - Whitefish Basin Forum
- meeting to discuss the Proposed Forest Plan.

April 21, 1983 - Women in Timber
- meeting to discuss the Proposed Forest Plan.

April 21, 1983 - Kalispell Rotary
- meeting to discuss the Proposed Forest Plan.

April 23, 1983 - Montana Trappers Association
- meeting to discuss the Proposed Forest Plan.

May 5, 1983 - Lions Club
- meeting to discuss the Proposed Forest Plan.

July 13, 1983 - ORV users
- meeting to discuss groups concerns regarding the closure of land to ORV use.

January 7, 1985 - Sunrisers Lions & Lioness Clubs
- meeting to discuss DEIS & Proposed Forest Plan Supplements (40).

January 24, 1985 - Society of American Foresters local chpt.
- meeting to discuss DEIS & Proposed Forest Plan Supplements (20).

February 19, 1985 - Methodist Men's Club
- meeting to discuss DEIS & Proposed Forest Plan Supplements (18).

March 4, 1985 - Swan View Coalition
- meeting to discuss water quality for proposed Noisy Face Timber Sale

March 14, 1985 - Swan View Coalition
- meeting for Forest Service to listen to concerns regarding Forest management of the Swan Face area (23).

e. **Business and Industry**

March 26, 1981 - National Forest Products Association
- meeting to coordinate cost coefficient development for the Forest Plan.

July 22, 1981 - Western Environmental Trade Association
- meeting to coordinate the Forest Plan analysis.

November 18, 1981 - Inland Forest Resource Council
- meeting on analysis of the management situation.

December 16, 1981 - IFRC and WETA
- coordination meeting.

March 31, 1982 - WETA
- meeting to discuss analysis results.

April 4, 1983 - Kalispell Chamber of Commerce
- meeting to discuss the Proposed Forest Plan.

April 12, 1983 - Columbia Falls Chamber of Commerce,
- meeting to present Proposed Forest Plan.

April 18, 1983 - Kalispell Chamber of Commerce
- meeting to present the Proposed Forest Plan to the Natural Resource Committee.

April 14, 1983 - Phillips Petroleum
- meeting to comment on the Proposed Forest Plan.

April 25, 1983 - ARCO
- meeting to discuss ARCO's comments on the Proposed Forest Plan.

April 27, 1983 - Western Environmental Trade Association
- meeting to discuss the Proposed Forest Plan.

May 4, 1983 - IFRC
- meeting to discuss industries concerns with the Proposed Forest Plan.

June 30, 1983 - Montana Logging Assoc.
- meeting to discuss the Proposed Forest Plan.

October 17, 1983 - IFRC
- meeting to discuss industry's alternative and timber yields.

February 2, 1984 - IFRC
- meeting put on by IFRC to discuss their comments on the Proposed Forest Plan and where we are headed.

March 14, 1984
- oil and gas seminar.

December 14, 1984 - WETA
- meeting to discuss DEIS and Proposed Forest Plan Supplements (26).

February 5, 1985 - Kalispell Chamber of Commerce
- meeting to discuss DEIS & Proposed Forest Plan Supplements and Noisy Face management options (18).

February 20, 1985 - Columbia Falls Chamber of Commerce
- meeting to discuss DEIS & Proposed Forest Plan Supplements (24).

f. Individuals

October 28, 1980 - Gerald Bowan
- meeting with private landowner to discuss his access dependency in response to Forest news release.

January 30, 1984 - Thomas J. Esch
- meeting and letters regarding the Le Beau roadless area on the Kootenai National Forest portion resulting in a correction to the roadless boundary of this area.

April 6, 1984 - Keith and Wayne Hammer
- office meeting to discuss Forest planning, public involvement, and Noisy Face (2).

December 18, 1984 - Dave Ensign
- phone contact by Dave, asking about input needed to assure protection of a ski area and expressing concern about grizzly bear guidelines - that Situation 1 would create severe conflicts with land uses (1).

January 11, 1985 - Deith Hammer
- office meeting to discuss roading in connection with the Forest plan (1).

January 11, 1985 - Dennis Swift, F.H. Stoltz Land & Lumber Co.
- meeting to discuss the 10-year timber harvest program

January 14, 1985 - Keith Hammer & Mike Raiman
- office meeting to review the content of the Creston and Bigfork public meetings and also discuss grizzly bear management and economics (2).

January 16, 1985 - Lou (no last name given)
- office meeting - questioned widening of Highway 83 through Swan Valley and expressed his thoughts on managing public land for national public rather than just for local public (1).

January 16, 1985 - Keith Hammer
- phone contact from Keith asking if the 190 MMBF referred to in a recent newspaper article was part of a plan the Forest was working toward (1).

January 31, 1985 - Jim Barnett
- concerned about grizzly bear management (1). phone

February 6, 1985 - Rosiland Yanishevsky, NFPA
- office meeting to discuss grizzly bear management guidelines and old-growth management (1).

February 15, 1985 - Mike Raiman
- office meeting to discuss grizzly bear management direction on the Forest (1).

March 7, 1985 - Bob Pellet, Cutbank, Snowgoer Club
- phone conversation to express his concerns about grizzly management, that it shouldn't take presidence over people. He also proposed multiple-use management for the Forest (1).

g. Media

February 25, 1983
- Press, Radio and Television, news release meeting about Forest Plan.

April 9, 1983
- Television, public forum.

November 9, 1984
- Press, radio, and television news briefing on the release of the DEIS & Proposed Forest Plan Supplements.

January 28, 1985
- "Live at Five" KCFW live interview with Illi to discuss DEIS & Proposed Forest Plan Supplements.

h. In-Service

October 1, 1984 - Heist, Super, & Reinsel RO - PPB
- meeting to discuss FEIS format and how to handle Noisy Face alternatives (8).

November 9, 1984 - Supervisor's Office
- meeting to discuss DEIS & Proposed Forest Plan Supplements (0) {40].

December 4 & 5, 1984 - Glacier View Ranger District
- meeting to discuss DEIS & Proposed Forest Plan Supplements (33).

December 7 & 8, 1984 - Hungry Horse & Spotted Bear Ranger Districts
- meeting to discuss DEIS & Proposed Forest Plan Supplements (32).

December 10 & 11, 1984 - Swan Lake Ranger District
- meeting to discuss DEIS & Proposed Forest Plan Supplements (33).

December 12, 1984 - Tally Lake Ranger District
- meeting to discuss DEIS & Proposed Forest Plan Supplements (27).

January 9, 1985 - Regional Office
- meeting to discuss DEIS & Proposed Forest Plan Supplements (34).

January 10, 1985 - Regional Office
- meeting to discuss DEIS & Proposed Forest Plan Supplements (13).

January 15, 1985 - Supervisor's Office (engineers)
- meeting to discuss DEIS & Proposed Forest Plan Supplements (44).

January 31, 1985 - Supervisor's Office
- meeting to discuss DEIS & Proposed Forest Plan Supplements (16) [35].

February 14, 1985 - Supervisor's Office
- meeting to discuss DEIS & Proposed Forest Plan Supplements and Noisy Face analysis (0) [25].

i. Interdisciplinary

February 8, 9, & 10, 1985
- workshop of interdisciplinary group to prepare recommendations for Flathead National Forest management. Contract led by Dean Ben Stout, U of Montana (30).

C. SELECTED ISSUES, CONCERNS, AND OPPORTUNITIES

Following is a discussion of the major issues, concerns, and opportunities that are the focus of the Flathead National Forest Plan and EIS. A detailed discussion of the present situation is given in Chapter III of the EIS. The issues are based on an analysis of the Forest's public involvement, including all responses from the public workshops, from the mailings, from the Forest Service employee meetings, and from public comments received on the Draft Environmental Statement, Proposed Forest Plan and their supplements. Management concerns are also listed as issues.

ISSUE 1. To what extent and where should the Flathead National Forest be managed for specific types of recreational activities?

a. Description of Issue

Public perception is that at the present level of management, the Flathead National Forest is not providing a broad enough spectrum of recreation opportunity; i.e., a mix of developed and dispersed recreation including an adequate trail system. Though the supply of developed recreation appears to be sufficient, there is dissatisfaction with the level of recreation opportunity related to developed recreation; e.g., poor maintenance, failure to meet replacement needs, and lack of visitor contact. Most dissatisfaction, however, is related to the lack of dispersed recreation opportunity.

Dispersed recreation is considered to be recreation occurring either in the unroaded Forest environment or throughout the roaded Forest. Existing roadless recreation opportunities are adequate to meet projected public use if measured in acres but lacking if evaluated in terms of visitor opportunities and quality of the recreation experience. Population growth, increasing tourist traffic, and a growing nationwide orientation toward the outdoors is expected to lead to increased use of the Forest's roadless areas by all user groups.

b. Treatment

The issue is addressed by examining a wide range of alternative patterns of land use which examine the extent and location for specific types of recreation activities and quality levels.

All management prescriptions address low, moderate, and high management intensity levels for recreation appropriate for each multiple-use prescription's emphasis. In addition, some prescriptions emphasize dispersed and developed recreation where th[illegible] uses constrain other uses.

Developed Recreation

Only the capacity and maintenance levels for public sites are directly affected by the alternatives. The Forest's public site capacity that would exist under different alternatives varies as some sites are closed to respond to the management objectives. All alternatives provide developed site capacity (both public and private) that exceeds the RPA objectives. In addition to varying developed site capacity, alternatives vary in terms of the funding available for maintenance and site improvement.

Dispersed Recreation

Each alternative provides a unique designation of roadless acres outside the existing and proposed wilderness areas. Some of the unroaded acres in each alternative are managed expressly to provide roadless dispersed recreation opportunities. Some are acres managed to meet other resource management objectives that do not require road construction, yet do provide the opportunity for roadless recreation.

Alternatives also vary the levels of management funding available for roadless dispersed recreation, with higher levels of funding implying higher visitor capacity due to improved trail maintenance and increased levels of trail construction/reconstruction and visitor information.

c. Capability to Respond

Developed Recreation

Adequate developed recreation capacity currently exists to accommodate projected use for the next five decades for most developed recreation opportunities. The exception is the use of developed skiing which is expected to exceed existing capacity.

Opportunities exist to increase the level of management of developed sites and to correct existing maintenance problems. Opportunities are available to change the distribution of developed sites by constructing additional developed facilities on sites currently being used. Concentrated public use is creating resource damage in some areas; this could be corrected through construction of developed sites designed to meet site-specific needs. Opportunities exist to expand the existing developed ski area on Big Mountain.

Dispersed Recreation

Opportunities for recreation activities requiring a roaded environment occur where roads are needed to meet other resource management objectives. The Forest should easily be able to meet expected levels of use.

Existing management direction does not ensure that roadless areas with high recreation values are managed as such. There are opportunities to identify and manage these areas to provide roadless recreation. Increased funding levels would allow for improved trail maintenance, trailhead facilities, and better visitor information services. By varying the funding levels for management of these areas, their capacity for providing recreation visitor days can be evaluated.

The indicator used to measure responsiveness to this issue is:

- Recreation visitor capacity in nonwilderness dispersed roadless recreation.
- Recreation visitor capacity in nonwilderness dispersed roaded recreation.

ISSUE 2. Which roadless areas or parts of roadless areas should be recommended for wilderness?

ISSUE 3. How should the areas not recommended for wilderness be managed?

a. Description of Issues

Public comments on these issues were generally at one end of the spectrum or the other, stressing the high amenity values or citing high commodity values.

The first viewpoint supported designation of many of the roadless areas to wilderness designation or formal roadless area designation; e.g., Jewel Basin Hiking Area. This viewpoint stressed the public benefit of wilderness values, backcountry recreation and ecological values. The second viewpoint generally stated that commodity development has already been delayed too long, and therefore these areas should be developed immediately. This group also expressed the feeling that the Flathead National Forest already has enough or too much wilderness.

One of the major resources to consider on the development side of the spectrum is timber. Many of these roadless areas were not developed in the past because they had low timber potential and high development costs. Some areas, however, have high timber potential and terrain suitable for development. Oil and gas exploration has received a great deal of interest and represents another possible resource tradeoff on the development side of the spectrum.

b. **Treatment**

The issues are treated by examining a wide range of alternatives for future management of the existing roadless areas. Roadless acres of the Forest are managed somewhat differently in each alternative. In the course of developing alternatives, a number of appropriate management prescriptions were tested on currently roadless lands. Management emphasis on these lands varies by alternative depending on the overall goal of the alternative and programed constraints. The alternatives evaluating wilderness were formulated to address various aspects of the roadless issue. These alternatives portray the results of analyzing the wilderness characteristics of each area or portions of these areas; the need related to each area reflected by public response and concern; and the availability of the particular area relative to the demand for other resources.

c. **Capability to Respond**

The Forest has 495,000 acres available that could be managed in the future for roadless values or additions to the existing wilderness system. Wilderness capacity generated by managing all 495,000 acres of roadless areas as full-service wilderness, would still be exceeded by the levels of projected wilderness use (809 MRVD per year) by 341 MRVD per year. Resolving the conflict between the long-range goals of wilderness and nonwilderness land uses will be the key to getting land management actions on a course to meet those future needs.

The indicators used to measure responsiveness to these issues are:

- Acres of roadless area.
- Acres of wilderness.

ISSUE 4. At what level should the Flathead National Forest manage the wilderness resource, including trail maintenance and fire management?

a. **Description of Issue**

Presently differences exist between private, public, and commercial interests as to what constitutes wilderness resource damage or problems. The ultimate answer to the wilderness management level question would be: the level that ensures minimum expenditure of public funds, provides maximum freedom of choice, absence of regimentation of the individual, retention of wilderness character and other resource values of classified lands.

Unfortunately, past use, the resource damage that exists in some areas, and the increasing number of people desiring to visit and operate in the wilderness preclude the choice of the lowest management level - no management. These lands have limitations, and the management level should be that level necessary to address public and management concerns to correct existing problems.

b. Treatment

In all alternatives, the wilderness resource will be preserved to the extent possible under existing laws and regulations. The capacity of the wilderness resource for recreational use and the quality of the wilderness resource in the future are directly linked to successful implementation of wilderness resource management programs.

Alternatives consider two levels of funding for wilderness management in various combinations. These funding levels imply different levels of trail maintenance, visitor contact, information and education, and permit administration resulting in wilderness resource protection. The user capacity of the wildernesses is linked to funding levels assuming that increased use could be accommodated if (1) trails are maintained so use can be dispersed, (2) visitor information and education is maximized so user impacts are reduced, and (3) special-use permit administration is improved to minimize potential impacts. The funding levels also call for different time frames for the development and implementation of a Wilderness Fire Management Plan and Limits of Acceptable Change wilderness use analysis.

c. Capability to Respond

The three wildernesses can sustain higher than current levels of use without damage to the wilderness resource or other resources if funding levels are increased. An increased level of funding would allow increased visitor contact and education, improved trail maintenance, and help achieve an improved distribution of wilderness users.

Even with a high intensity of management, however, wilderness capacity would be exceeded by levels of projected use around the year 2000. At that point, unrestricted use would begin to adversely impact the wilderness resource.

Increased levels of funding for management and diversion of some wilderness recreation use to dispersed roadless recreation areas could improve the ability of the wildernesses to deal with anticipated levels of use.

ISSUE 5. What are the visual management objectives for viewing areas within the Flathead National Forest?

a. **Description of Issue**

An inventory of the Forest has identified areas where the visual significance of the nonwilderness landscape is high. (The wildernesses will, under all alternatives, be managed with objectives that preserve their visual quality.) If the view is to remain natural-appearing or relatively natural-appearing, resource management activities in these important areas would be guided by recommendations that retain or partially retain the natural appearing view over time.

b. **Treatment**

This issue was addressed through the development of alternatives. Each management prescription includes a visual quality objective appropriate for that prescription's management emphasis. In addition, a series of prescriptions emphasize management practices and costs needed to achieve certain visual quality objectives. As each alternative was developed, the outputs, costs, and effects on areas of the Forest proposed for visual management emphasis were analyzed.

c. **Capability to Respond**

Each alternative provides visual management objectives that can be evaluated against the Forest potential.

If the Forest were managed to meet all recommended visual quality objectives, over 500,000 acres of the Forest's nonwilderness landscape would be retained or partially retained as natural in appearance, however, not all alternatives provide the opportunity to meet recommended visual quality objectives on some critical areas of the Forest.

The indicator used to measure responsiveness to this issue is:

- Acres of partial retention and retention.

ISSUE 6. How much and what type of habitat should the Flathead National Forest provide for diverse fish and wildlife species, including those classified under the Endangered Species Act?

a. **Description of Issue**

Public groups were primarily interested in habitat protection and management, particularly enhancement of winter range areas. People felt that low Forest Service budgets for fish and wildlife were limiting a more active habitat improvement program.

There was concern for the effects of increased roading and concurrent timber harvest on all wildlife and fish habitats, particularly threatened or endangered species.

Existing fishing pressure on some areas appears to be impacting fisheries production and hence the quality of the recreational fishing experience. Potential development and associated unavoidable environmental impacts of a coal mine on the North Fork of the Flathead River in Canada will increase the significance of the Flathead National Forest's fisheries habitat in the North Fork drainage. The increased importance of this habitat needs to be considered.

b. **Treatment**

Alternatives do not directly impact fisheries in streams in the wildernesses or in Forest lakes, unless the lake fish populations depend on adfluvial production. The effects of alternatives and benchmarks were analyzed in terms of trout populations in streams located in a nonwilderness environment. The effects on game fish were tracked by means of coefficients developed to express the relationship between sediment and fish production.

Snags and dead, down, woody material provide habitat for approximately 70 species of birds and mammals and are protected in all alternatives through a set of management guidelines.

All management prescriptions contain goal statements, output coefficients, management costs, and standards and guidelines for wildlife habitat management and coordination with other uses.

All alternatives provide protection for bald eagle and peregrine falcon nesting sites through management guidelines applied Forest-wide to management activities that have a potential for disturbing these endangered species.

Management prescriptions include consideration of grizzly bear and gray wolf habitat management relative to each prescription's management emphasis, and the coefficients index each prescription's relative effect on bear habitat. In addition other prescriptions emphasize bear and wolf habitat management; elk, mule deer, and whitetailed deer winter habitat; and riparian fish and wildlife habitat management. Various objectives were placed on habitat management for these species, to formulate a wide range of alternatives. Evaluation is based on an analysis of the resulting component outputs, effects, and costs as to how effectively they respond to the issue.

c. Capability to Respond

The potential to increase fish populations exists through making investments in habitat improvement. Production potential for fish, however, is limited by water with low inherent productivity. Fish habitat improvements, a reduction of livestock grazing in riparian areas, and management of riparian zones to emphasize fisheries habitat would result in a maximum increase of about 30,300 fish in each of the first two decades. This maximum production potential does not provide an opportunity to meet Montana Department of Fish, Wildlife, and Parks objectives but does allow opportunity for an improved recreational fishery.

Management of potentially suitable winter range to whitetailed deer or mule deer/elk management emphases would allow for improvement of existing cover/forage relationships over time and support larger populations of these species. Maximum forage production potential for whitetailed deer, mule deer, and elk could support about twice the Forest's current population.

Opportunities exist to increase the number of hunting opportunities through increased big-game populations and a road management program that provides both adequate access for hunters and secure habitat for big-game animals.

The Flathead National Forest has the ability to provide a range of habitat conditions responding to the Grizzly Bear Recovery Plan prepared by the U.S. Fish and Wildlife Service. The objective of the Recovery Plan is to remove the grizzly bear population from threatened species status. Flathead National Forest habitat can be managed to provide a range of contributions to meet the intent of the Recovery Plan for the Northern Continental Divide Ecosystem.

The opportunities to provide habitat for the gray wolf are linked to providing security from human disturbance as well as contributing to the prey base by providing ungulate habitat. At this time, the prey base is adequate and not believed to be a limiting factor. Because grizzly bear mangement calls for security, opportunities to increase the gray wolf population are linked to the grizzly bear management opportunities.

Opportunities to protect and provide habitat for bald eagle and peregrine falcon populations are evidenced in guidelines that restrict management activities in the vicinity of nesting and feeding sites.

A subissue, which developed in late 1984 and early 1985, is whether the mountain caribou still inhabits portions of the Whitefish Mountain range. Occasional sightings and some possible caribou tracks have been reported. Ground and aerial surveys in 1984 and 1985 detected no animals or solid evidence of their presence. The Forest Plan has established an annual monitoring item to continue cooperating with State and private wildlife organizations in assessing the potential existance or reestablishment of mountain caribou on the Flathead National Forest.

The indicators used to measure responsiveness to this issue are:

- Population potential of elk in fifth decade.
- Population potential of grizzly bears.
- Old growth potential acres below 5000 feet in elevation.

ISSUE 7. What level of forage production can be used by domestic livestock, while protecting other Flathead National Forest resource values?

a. Description of Issue

There was no public interest at the workshops on this issue. It is an In-Service management concern. The concern for the other resources is not relative just to the amount of forage. The type of forage, soils, time of use, type of animal, physical controls, legislative classification, and other resource designations, all influence the amount of forage which can be utilized from a given area.

Existing recreational stock grazing in the three wildernesses is believed to be at the highest level compatible with wilderness resource management. In some areas, excessive grazing is adversely impacting the range and wilderness resources.

b. Treatment

This concern was addressed primarily through range management and utilization programs compatible with each alternative's emphasis. The management prescriptions reflect varying levels of range management intensity and utilization, dependent on resource management emphasis. Forage production capacity for each alternative was estimated by decade and expressed as potential grazing capacity.

c. **Capability to Respond**

The market profile developed for the Flathead National Forest range resource does not indicate that the Forest needs to consider creating permanent range or expanding beyond what is considered manageable and accessible in the range analysis.* Projected use for permitted livestock AUM's locally is not expected to increase significantly. Periodic use, however, of the Forest's transitory range by cattle from eastern Montana may increase.

At the maximum, transitory range forage production on the Forest could theoretically support at most 12,000 AUM's. If this were adjusted to reflect transitory range that is or would be accessible and manageable, the Forest could support 4,120 AUM's of permitted livestock use.

Opportunities exist for decreasing and/or redistributing stock grazing in the wildernesses. Education and administration opportunities also exist.

ISSUE 8. What should the sustained yield timber harvest level for the Flathead National Forest be, recognizing basic land productivity, economics, scommunity stability, and other resource needs?

ISSUE 9. What timber harvest, silvicultural, and reforestation methods should be used on the Flathead National Forest considering economics, energy, and ecological requirements?

a. **Description of Issues**

The 1969 Timber Management Plan was developed with a concern for maximum wood fiber production on all but a very select land base. Since then, resource concerns such as roadless recreation and wilderness, visual and water quality, wildlife habitat, soils, ownership patterns, and economics have been recognized as potentially conflicting with those timber management assumptions and objectives. There are widely differing views regarding the degree of conflict and/or compatibility of timber harvest with other resource values. These issues generate strong public input and responses because the resolution of the issues is perceived to directly affect so many people's lifestyles and values.

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* See "Flathead National Forest Range Market Profile," draft, August 1981, Flathead Forest planning records.

The National Forest System and private industry lands are the primary sources of raw material for local mills. Timber industry has indicated a need to better correlate Forest Service annual harvest schedules with the increases or decreases in timber volume harvested from private lands. Departure from nondeclining even flow may provide this opportunity.

Disproportionately heavy timber cutting in some areas of the Forest has created multiple-use conflicts and potential problems with future distribution of timber harvests.

The public expressed concern over the extensive use of clearcutting. Some people want the land to be reforested more quickly, while others want more use of selective harvesting.

b. Treatment

These issues were addressed primarily through alternative development and analysis of the outputs and effects of alternatives measured by acres and harvest volume scheduled by time period for various timber harvest, silvicultural, and reforestation methods.

FORPLAN was allowed to model only those harvest methods, cultural practices, and yields that are compatible with the biological and physical capabilities of the land comprising each analysis area.

Alternatives were formulated by specifying a wide range of harvest objectives, land use patterns, and levels of constraints for enhancement of nontimber outputs.

c. Capability to Respond

Opportunities to manage for increased or decreased levels of timber production need to be evaluated. The Forest is capable of exceeding current harvest levels and RPA objectives by increasing timber management funding levels, increasing lands that emphasize timber management, or both. By maximizing timber production, the Forest can produce 171 MMBF per year in the first decade with a sustained yield of 201 MMBF per year.

The opportunity to lessen impacts on other resources requires better distribution of timber harvest. Harvest in impacted areas would need to be delayed. This would result in increases in harvest from steeper slopes and unroaded areas.

Opportunities exist to convert lodgepole pine stands to mixed conifer stands to achieve a level of tree species diversity, reducing the potential for future insect and disease problems.

Opportunities for converting stagnated stands to productive stands also need evaluation.

The cost efficiency objective of the analysis provides an opportunity to assess costs and benefits of managing to provide various levels of timber harvest. This objective also provides the opportunity to more efficiently schedule management activities. The opportunity exists to utilize timber harvest to meet wildlife and visual resource management objectives.

The indicators used to measure responsiveness to these issues are:

- First and fifth decade harvests.
- First decade lodgepole pine harvest.
- Long-term sustained yield.
- Suitable acres.
- Changes in employment.
- Budget.
- Net Receipts.
- PNV.

ISSUE 10. What utilization standards should the Flathead National Forest require in order to achieve optimum utilization of all wood fiber?

a. **Description of Issue**

The timber industry recently has made considerable improvements in the utilization of timber from Forest Service timber sales. Timber yield predictions are based on implementation of new utilization standards. Recent public comment, however, indicates that not all timber industry can use the new utilization standards, and that these standards are unrealistic and too high. Consequently the amount of volume available is overestimated.

b. **Treatment**

The Forest applied to the alternatives, the utilization standards recommended in the Regional Guide.

c. **Capability to Respond**

The Forest calculated volume under the new utilization standards and, for comparison, calculated volume under the old utilization standards. The new standards indicate approximately 5 percent increase in yield. Comparison of these volumes are displayed in the final EIS.

ISSUE 11. How much access and availability of fuelwood for domestic and future commercial use should the Flathead National Forest provide?

a. Description of Issue

The public expressed concern about the Forest Service burning wood residue that they felt should be made available to them for firewood use. Improved utilization of timber from Forest Service sales has somewhat reduced the amount of material available for firewood. Also access to areas where firewood is available has been a problem due to road closures.

Safety violations, cutting of timber for firewood in timber sales, and poor slash cleanup indicate a management concern for more public information about Forest Service policies and constraints on firewood cutting.

b. Treatment

In all alternatives, firewood is a significant Forest resource. Ease of access varies in relation to the alternatives' objectives of roadless recreation, wilderness, wildlife habitat, or other resource protection through road management.

c. Capability to Respond

Alternatives maximize the opportunity for the public to gather firewood through use of a Forest firewood permit. Total firewood available varies by alternative and is dependent upon total volume harvested, total miles of road constructed, and the road management program.

ISSUE 12. To what extent can the Flathead National Forest coordinate management activities on National Forest System lands with adjacent private lands to protect and maintain the quantity and quality of the water resource?

a. Description of Issue

Currently no local need exists for increased water yields; however, passage of a State water development plan by the 1981 Montana legislature indicates that the need for water will increase. Occupying a critical headwaters postion against the Continental Divide, the Flathead River drainage will be looked at closely as a source of high quality water.

b. Treatment

Water yield, that is quantity, varies between alternatives depending upon the number of acres harvested and the associated reduction in tree canopy. Water quality varies between alternatives depending upon the amount of timber harvest and associated road construction activities.

c. **Capability to Respond**

Opportunities to maintain high water quality require attention to the amount and distribution of timber harvested and/or roads built in certain areas as well as how the activities are carried out on the ground.

State and Federal Law, Federal regulations, and Executive Orders mandate that water quality will be protected or enhanced. Indirect effects of special riparian zone and wetland protection will help protect water quality as well.

The indicators used to measure responsiveness to this issue are:

- Riparian area management intensity.
- Number of catchable trout.
- Relative sediment risk ranking.

ISSUE 13. Where, how much, and under what conditions should the Flathead National Forest provide for oil and gas exploration and development?

a. **Description of Issue**

Some members of the public hope that oil and gas exploration and leasing do not result in any discoveries. Also if discoveries are made, the general public feels that subsequent development of those fields is unavoidable and necessary in view of national energy independence goals and local economic needs. Public input on eventual development will be in the area of how to mitigate adverse impacts on other resource values, especially water quality, air quality, wildlife, scenic values, and maintaining the Flathead's quality of life.

b. **Treatment**

For all alternatives, Forest administration of mineral activities would be in accordance with the 1872 Mining Law, the 1920 Mineral Leasing Act, the 1969 National Environmental Policy Act, the Federal Land Planning and Management Act of 1976, and 36 CFR 252. Only in existing wildernesses and other special management areas; e.g., Jewel Basin Hiking Area, would oil and gas leasing not be allowed to continue. In other portions of the Forest, mineral development and surface management objectives are usually compatible if leases or permit restrictions are included. The amount of special stipulations vary with each alternative depending upon how much that alternative designates special surface management objectives which may conflict with mineral development.

c. **Capability to Respond**

The best existing evidence indicates that opportunities to extract hard rock minerals on Flathead National Forest lands are limited. Opportunities for oil and gas field development are rated as high from the speculative standpoint, but low from the probability of seeing on-the-ground commercial production. The physical and economic feasibility remains unknown. There are opportunities to explore for and develop hydrocarbons under standard resource protection stipulations, as well as opportunities that are restricted by concerns for special resource objectives. Opportunities to consider changes from current management direction are limited by existing Federal laws and regulations regarding administration of oil and gas leases.

An oil and gas environmental assessment prepared by the Forest in 1980, documents the possible environmental consequences associated with leasing, and provides the basis for the Forest's lease recommendations. The environmental analysis to support the oil and gas leases was declared to be in violation of NEPA and the Endangered Species Act in a 1985 Federal Court decision. The court ruled that all Flathead National Forest oil and gas leases be set aside. This court decision is under appeal to the Ninth Circuit Court of Appeals. All oil and gas leases have been suspended pending the outcome of this lawsuit. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS by incorporating, by reference, the information presented in this EIS.

ISSUE 14. To what extent should the Flathead National Forest adjust and consolidate landownership in order to support resource management and improve management efficiency?

ISSUE 15. How should the Flathead National Forest deal with the impacts created by the activities on private land inholdings?

a. Description of Issues

Landownership pattern is one of the major factors which can affect the level and ability to apply intensive land management practices for the general benefit of the public. Management direction must determine to what extent landownership should be adjusted for management efficiency of the various resources involved.

The most critical concern is conducting land management in a dispersed landownership pattern. This type of land management condition is time consuming, expensive, and often conflicting with adjacent landownership management practices. The concern is not just the effects other landowner activities have on National Forest System land, but also what effects Forest Service activities have on other ownership. It seems that the potential for better overall land management practices exist through landownership consolidation.

b. **Treatment**

Land adjustment would be accomplished in response to the resource objectives and land management patterns associated with each alternative. The objectives of any landownership adjustment program would be to improve the Forest's ability to meet the management intent of an alternative. Land adjustment objectives and guidelines are given for each multiple-use prescription. Land adjustment objectives for Forest Plan alternatives are made from land use patterns designated under each alternative.

c. **Capability to Respond**

Land adjustment opportunities can be explored that support resource management objectives. Land adjustment could provide an opportunity to improve management of prime grizzly bear habitat and whitetailed deer winter range, or exchanges could be considered that increase the cost-effectiveness of Forest management. Opportunities to develop land adjustment programs are affected by administrative, political, and legal constraints.

ISSUE 16. What level of management activities should take place on the Flathead National Forest while protecting the soil resource?

a. **Description of Issue**

Land management activities require some soil displacement to varying degrees. Major causes of displacement include road development, harvest activities, slash disposal, site preparation, and grazing.

Glacial till soils on the Flathead National Forest are generally highly productive but susceptible to surface compaction. Compaction contributes to delayed reforestation. Tractors and rubber tire skidders are presently being used for logging, slash disposal, and site preparation work. Total percent of ground covered by these machines and timing are key factors affecting soil degradation.

b. **Treatment**

The NFMA regulations require that management prescriptions not allow significant or permanent impairment of the productivity of the land. Management guidelines define management practices to be used on different landtypes that will maintain soil productivity. Under all alternatives, activities would be implemented using the appropriate guidelines and constraints to ensure protection of the soil resource.

c. **Capability to Respond**

Some soil loss is unavoidably associated with Forest management, in particular timber harvest activities and road construction. Output coefficients developed for each prescription enables us to estimate the effects of management activities on sediment production. In addition, each management activity associated with a prescription likely to affect soil loss, references applicable land type group standards and guidelines.

ISSUE 17. How shall Flathead National Forest roads be constructed, managed, and maintained to best meet resource needs within sound environmental, economic, and social considerations?

a. **Description of Issue**

The public feels that road planning, construction, and management is one of the most important issues in the Forest Plan. Road construction, reconstruction, and maintenance directly support achievement of Forest objectives.

Additional access through road construction is needed if the Flathead National Forest timber resource is to be managed, even if less development occurs as projected under Current Direction.

b. **Treatment**

This issue was addressed by a Forest policy statement that sets the framework for construction and maintenance standards, and by analyzing outputs and effects of alternatives as measured by miles of road constructed by time period and associated costs.

c. **Capability to Respond**

Opportunities exist for management of roads to meet prescribed resource management objectives. Road management options include seasonal closures, permanent closures, and removal of the road from the Forest transportation system. Opportunities to alter road design and construction standards from the current situation need to be explored.

The indicator used to measure responsiveness to this issue is:

- Miles of road to be constructed.
- Effective open road densities.

ISSUE 18. What fire management activities are appropriate on different areas of the Flathead National Forest?

a. **Description of Issue**

Forest land managers have recognized that the diversity of landforms, land management objectives, and vegetative communities which exist within the boundaries of the Flathead National Forest present opportunities for the application of differing fire management prescriptions.

b. Treatment

This issue was addressed primarily by analyzing outputs and effects of alternatives measured by acres of full suppression, prescribed burning for resource management objectives, and prescribed natural fire. The management prescriptions include general fire management objectives appropriate for each prescriptions's emphasis. As the management emphasis changes for each alternative, the fire management activities on a given part of the Forest will change.

c. Capability to Respond

Opportunities to determine cost-effective fire management programs are determined by the fire management objectives. The appropriate mix of fire management activities needs to be determined. An increase in the proportion of harvest on steeper slopes will necessitate some changes from the existing site preparation program as a more extensive prescribed burning program will be required.

ISSUE 19. How should the Flathead National Forest prevent or mitigate insect and disease damage to resource and economic values?

a. Description of Issue

This issue is primarily a management concern. Currently the Forest has serious infestations of mountain pine beetle. Expected mortality of some lodgepole pine stands is 70-100 percent in some cases.

b. Treatment

Management activities designed to improve this condition are accelerated access to and harvest of high-risk lodgepole pine stands. Other insect and disease problems on the Forest are being dealt with by implementing appropriate silvicultural practices as the stands come under management. Efforts are made annually to identify priority areas in need of specific treatments.

c. Capabililty to Respond

Different harvest schedules and land designations provide opportunities to improve on the distribution of timber by age class. By increasing the number of tree species and age and size distribution of regulated timberlands, the risk of epidemic populations of insects and disease can be reduced.

DESCRIPTION OF THE ANALYSIS PROCESS - APPENDIX B

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APPENDIX B

DESCRIPTION OF THE ANALYSIS PROCESS

CHAPTER I. INTRODUCTION

A. PLANNING SITUATION

The Forest Service is responsible for determining how to best manage National Forest System lands based on public desires and land capabilities. The capabilities of the Flathead National Forest are influenced by its mountains with rocky, jagged peaks and forested slopes with short growing seasons and rocky soils. Almost half the Forest is currently wilderness. The remainder of the Forest supports roaded and unroaded recreation, including big-game hunting, viewing scenery, harvesting timber, and domestic grazing. A tourist and recreation-outfitter industry, a local woods products industry, numerous dependent water users, and some livestock permittees are dependent on the Forest.

Public interest includes divergent viewpoints about the use of commodities such as timber, grazing, and minerals and noncommodities such as wilderness, unroaded recreation, scenery, wildlife, old growth, and diversity. The Forest's major planning goal is to provide enough information to help decisionmakers determine which combination of goods, services, and land designations will maximize net public benefit (see Chapter IV of this Appendix). The NFMA (National Forest Management Act) and the regulations developed under NFMA (36 CFR 219) provide the analytical framework to address this objective. It also states how the requirements of the NEPA (National Environmental Policy Act) and its regulations (40 CFR 1500-1508) must be applied in this analysis process.

B. PLANNING PROCESS

The planning and environmental analysis process brings a new outlook and a new technology to National Forest System land management. Principally, processes formerly used to make individual resource decisions are now combined to help make integrated management decisions, and mathematical modeling techniques are used to aid in land management decisions. The 10-step planning process is discussed in the NFMA regulations and in Chapter I of this document. Appendix B describes the analysis phase of this process including steps 3, 4, 5, and 6. The judgement phase, steps 1, 2, 7, and 8, is described in Chapters I, II, and in Appendix A. The execution phase, steps 9 and 10, is presented in the Forest Plan.

1. INVENTORY DATA AND INFORMATION COLLECTION (STEP 3)

The interdisciplinary team determined what data was necessary based on the issues and concerns. The analysis of the management situation, formulation of alternatives and monitoring require data on resource capabilities, existing supply and demand, expected outputs, benefits and costs. Existing data was used whenever possible but was supplemented with new data to help resolve sensitive issues or management concerns. Data is on file in the Forest Supervisor's Office.

2. ANALYSIS OF THE MANAGEMENT SITUATION (STEP 4)

This analysis examines resource supply and market conditions and determines suitability and feasibility for resolving issues. A mathematical land use model (FORPLAN) was used to address a number of specific requirements, including benchmarks. Requirements include: (a) the projection of the Forest's current management program; (b) determining the Forest's ability to produce a range of goods and services from minimum management to maximum production; (c) evaluating the feasibility of reaching the national production goals (RPA targets) and social demands identified as issues and concerns; and (d) identifying monetary benchmarks which estimate the output mix which maximizes present net value (or minimizes the cost) of resources having an established market or assigned value and meeting other departure analysis requirements. The analysis of the management situation provides the information necessary to formulate a wide range of reasonable alternatives. The analysis of the management situation document is on file in the Forest Supervisor's Office.

3. FORMULATION OF ALTERNATIVES (STEP 5)

The information gathered during the first four planning steps is combined and analyzed to formulate alternative management plans. The alternatives reflect a range of resource management direction. Each major public issue and management concern was addressed in one or more alternatives. Management prescriptions and practices were formulated to represent the most cost-efficient way of attaining the objectives for each alternative. Both priced and nonpriced outputs are considered in formulating the alternatives. See Forest planning record: Analysis of Management Situation and Alternatives.

4. ESTIMATION OF EFFECTS OF ALTERNATIVES (STEP 6)

The physical, biological, economic, and social effects of each alternative were estimated and analyzed to determine how each responds to the range of goals and objectives assigned by the RPA program. FORPLAN was used to estimate some of the economic and physical output effects while other methods were used for remaining effects. The analysis included: (a) direct effects; (b) indirect effects; (c) conflict with other Federal, State, local and Indian tribe land use plans; (d) other environmental effects; (e) energy requirements and conservation potential; (f) natural or depletable resource requirements and conservation potential; (g) historic and cultural resources; and (h) means of mitigation.

CHAPTER II. INVENTORY DATA AND INFORMATION COLLECTION

A. RESOURCE DATA DEVELOPMENT

1. CAPABILITY AREAS

The basic resource data storage unit is the capability area. Capability areas are lands delineated for the purpose of estimating their response to various management practices, resource values, output coefficients, and multi-resource or joint projection functions (FSM 1920.5). There are approximately 10,000 capability areas. Forest capability areas were based on the following criteria:

a. Watershed

The national system of delineating hydrologic units was used to identify watersheds and subwatersheds. Watersheds were identified including those completely in existing wilderness. These watersheds provide water resource inventory, analysis, and monitoring data storage units. (U.S. Water Resources Council, 1974.)

b. Compartments

Timber inventory compartment boundaries were utilized as subdivisions of subwatersheds to provide a link to the timber data base. The 197 compartments also provide a means to separate data by county, ranger district, or other geographic area.

c. Habitat Type and Landtype

The basic capability unit was identified by the combination of 8 vegetative habitat type groups, indicators of biological potential; and 16 landtype groups, indicators of physical characteristics such as slope, aspect, and elevation.

Guidelines defining vegetative management practices and reasons for their choice were prepared for each vegetation type group. Similarly, guidelines for each landtype group outlining management practice limitations were prepared. These guidelines define minimum management requirements that define the feasible practices responsive to NFMA regulations. These guidelines are used throughout the planning process including stratification of the Forest for analysis, preparation of prescription, assignment of prescriptions to analysis areas, and project design as a result of incorporation into the Forest Plan Standards.

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* See the Forest planning records or Appendices I and Q of the Forest Plan.

2. ANALYSIS AREAS

Similar capability areas are combined to form analysis areas. The similarities are in terms of common capabilities to produce resources and to susceptibility of impacts. There are 521 analysis areas. (See Forest planning record: Flathead National Forest Analysis Area Criteria.)

3. PRODUCTION COEFFICIENTS

Resource outputs were developed by linking resource suitability and economics to analysis areas. Analysis areas suitable for timber production were linked to habitat type group productivity classes which were linked to timber outputs derived from timber inventory data. Analysis areas suitable for cattle grazing were linked to capability areas suitable for grazing which were tied to forage production estimates. Forage production for deer and elk was linked to habitat type and constrained by the limited amount of suitable winter range and desired forage cover ratios. Recreation coefficients were tied to use projections based on population trends. Road construction miles were tied to timber harvest and logging methods. Other resource data including costs, benefits, slope, geology, and riparian areas were utilized to further refine or constrain outputs for alternative management prescriptions. (See Forest planning records, Coefficient Documentation and Rules for Assigning Prescriptions to Analysis Areas.)

Production coefficients used on the Forest were expressed in the following units:

Timber: Thousand cubic feet/acre
Roadless Dispersed Recreation: Recreation visitor days/acre/year
Roaded Natural-Appearing Recreation: Recreation visitor days/acre/year
Developed Recreation: Recreation visitor days/acre/year
Wilderness Recreation: Wilderness visitor days/acre/year
Retention Visual Quality Objective: Acres of retention VQO
Partial Retention Visual Quality Objective: Acres of partial retention VQO
Winter Deer/Elk Forage: Thousands of pounds/acre/decade
Grizzly Bear Habitat Potential: Bear density number/acre/year
Livestock Forage: Thousands of pounds/acre/decade
Local Road Construction Costs: Purchaser road credits thousands of dollars/mile
Lump Sum Implementation Costs: Nonscheduled costs of implementation of prescription dollars/acre/decade
Road Construction: Miles/acre and engineering cost/mile
Road Maintenance Cost: Nontimber maintenance cost on local roads constructed, dollars/mile/decade
Sediment: Thousands of pounds/acre/decade

4. SUITABLE LANDS

The Forest used specific data to determine the acres that are tentatively suitable for management practices. All areas are considered available for some form of recreation and some type of wildlife use. Roadless area size and evidence of human activity were used to determine wilderness suitability. Forest habitat type, landtype timber inventory data, and legal status were used to determine areas tentatively suitable for timber production. Forest habitat type and landtype were used to determine areas tentatively suitable for domestic livestock management practices. Use by elk and deer for winter or summer range was determined by habitat type, elevation, aspect and maps of historic use. The following discussion is a summary of suitability criteria. Additional details are available in the planning records.

a. Range

The following landtypes were reviewed by Al Martinson, Forest Soil Scientist, and Warren Williamson, Range Specialist, and determined to be incapable of producing the required 50 pounds of dry palatable forage per acre required for suitable range.

Land Class 3 - Avalanche fans and talas slopes. This land group consists basically of rubble and debris on the north slopes and brush fields on south slopes. There is little soil to support range forage growth.

Land Suitability - The following capable land classes were reviewed by the Forest Soil Scientist and Range Specialist and were determined to be unsuitable for utilization of the forage resource due to basic soil or topographic constraints.

Land Class 13 - Alpine Ridges and Rocklands
Land Class 14 - Glacial Trough Walls
Land Class 15 - Fluvial Breaklands
Land Class 16 - Structural Breaklands. All were not suitable because of topography. All have 60 percent + slopes.
Land Class 10 - Mixed Glacial Soils, and
Land Class 12 - Residual Soils were basically eliminated because of topography (slopes 40-60 percent), also has shallow soils to bedrock.

Land Classes which are now eliminated from forage production consideration in the Flathead National Forest Plan are: Land Classes 3, 10, 12, 13, 14, 15, and 16.

The following additional land classes should receive special consideration or precautions when utilizing the grazing resource: Land Classes 1, 2, 6, and 9 should receive seasonal use with Classes 6 and 9 basically used during the dry season. Land Classes 4, 7, 8, and 9 have compactable soils. Grazing on clearcut areas should be restricted until regeneration has been satisfactorily established.

b. Timber

The basic land unit evaluated in identifying Flathead National Forest lands tentatively available, capable, and suitable for timber production was the capability area. The criteria for a Flathead National Forest capability area (a contiguous area of land of essentially uniform habitat type group and landtype) effectively stratified the land into units with uniform physical and biological potentials. Each capability area was examined for its basic potential for receiving consideration for sustained yield commercial timber management in further analysis of suitability incorporating economic, social, and other resource considerations. This initial screen was accomplished by utilizing the Forest Planning Data Base to identify those capability areas which did not meet National and Regional standards of availability, capability, and suitability as follows:

(1) Availability

Due to the lack of timber data in wilderness areas and the fact that wilderness management analysis did not require detailed data on timber productivity or existing condition, the availability screen was made first. Federally-owned lands classified by formal administrative (Chief of Forest Service or higher) authority or Congressionally designated special areas were not available for timber management consideration.

Flathead National Forest criteria for capability areas not available:

(a) Bob Marshall Wilderness
(b) Great Bear Wilderness
(c) Mission Mountains Wilderness
(d) Flathead Wild and Scenic Rivers Systems outside wilderness boundaries
(e) Coram Experimental Forest

(2) Capability

Lands available for timber harvest were evaluated for capability according to the following data criteria:

Reason Unsuitable	Criteria
Nonforest Water	Capability areas which are all water (large lakes). Inclusions of smaller water areas within all other available capability areas (includes named lakes mapped in data base plus other water area defined by timber inventory statistics).

Reason Unsuitable	Criteria
Nonforest and Nonproductive Land	Capability areas not capable of growing 20 cubic feet per acre/year of industrial wood as defined by the following Soil and Habitat Type Classifications: — Landclass Group 2, Nonforest Wetlands and Wet Meadows (Landtypes 12-37 and 14-37). — Landclass Group 3, Nonforest Avalanche Chutes, Talus, and Scree (Landtypes 17-8, 18+ and Talus or Rock Debris phase of other glaciated or structural break landtypes). — Landclass Group 13, Nonforest and Nonproductive Alpine Ridges and Rockland (Landtypes 54+, 55+, 55X+, 55X-9, 71-0, 72-0, 75-0, and rockland phase of other glacially scoured or structural break landtypes). — Habitat Group 8, Cold-dry environments are considered unsuitable because there is inadequate information on response to timber management activities and they generally are not capable of production crops of industrial wood. An analysis of Flathead National Forest 1974 Timber Inventory Data was conducted in accordance with the process outlined in R-1 Memo 2410, 6/1/81, J. E. Bennett, to determine the timber productivity of questionable habitat types. Details of the analysis are documented in the paper "Determination of Lands for Timber Production on the Flathead National Forest, 219.12(b)." Results of the analysis by Habitat Type classified in Group 8 are summarized below:

Habitat Type - Phase	Code	FNF Capability From Inventory Data
AF/Vasc-Vasc	732	0.0 cu. ft./ac/yr, No stands, 3 nonforested sample points
AF/WBP/Vasc	820	No sample points
AF/Luhi	830	No sample points
AF/Luhi-Vasc	831	0-17.56 cu. ft./ac/yr., 6 forested stands, 7 nonforest stands, 91 points
WBP/AF	850	0.0 cu. ft./ac/yr., 1 forested, 1 nonforested stand, 18 points
AL-AF	860	No sample points
WBP	870	No sample points

Reason Unsuitable	Criteria
	Capability areas comprising special areas which are developed for use that preclude timber management. (2415.12--1, ID No. 68, 12/15/80). -- Big Mountain Ski Area
	Nonforest and nonproductive acres within potentially suitable capability areas are nonproductive land as defined by the noncommercial forest condition class from the timber inventory statistics, and land less than 16 percent forested as defined by acres of nonforest condition class and acres developed for other uses which preclude timber utilization as follows: -- Existing Corridors (powerline, highways, pipelines). -- Administrative sites. -- Developed recreation sites.
Unsuitable due to irreversible damage to basic productivity or Watershed. Not assured of restocking or not technologically suited	None identified on the Flathead if harvested with appropriate current harvest system technology.

(3) Process Criteria

Step 1. After all capability areas available for harvest were coded according to the desired Analysis Area Criteria, 1/21/81, the data base was asked to list all capability areas which meet the above criteria for whole capability areas. The areas were designated on USGS 2.64 inches/mi. maps.

Step 2. District Rangers and their staff reviewed the maps against the suitability criteria and source data coding sheets for accuracy by using aerial photos and their on-the-ground experience. A list of corrections was made so that data items in Landtype Group (Level 3) and Habitat Type Group (Level 4) reflected the real situation on the ground. The list of corrections with C.A. Number, Data item to change and reason or change is on file in the planning records 219.12(b) Timber. The corrections were reviewed with District personnel by the Forest Soil Scientist and Timber Planner.

Step 3. The list of data corrections for Data Base Component 24 (Landtype Group) and Component 25 (Habitat Type Group) was made in the data base without changing any of the coding in other components that generated the initial coding.

Step 4. After applying the data and process criteria to all available capability areas, an analysis of the Jewel Basin Scenic Hiking Area was made to determine if sufficient potential exists to justify further analysis for changing timber management direction for the area. If the potential was determined to be too small to significantly affect the Forest's ability to meet assigned targets in the future, and no change in timber management needed to be examined, then any Jewel Basin capability areas identified by data criteria as tentatively suitable were classified as unsuitable for FORPLAN analysis. If tentatively suitable acres were found in Jewel Basin, and they were determined to have significant potential for timber production, they were included in FORPLAN analysis for timber production.

Step 5. The corrected data resulting from applying the timber suitability screen was then used in constructing Analysis Areas for the FORPLAN Model (see Flathead National Forest Final Analysis Area Criteria in planning records).

Step 6. Summaries of water, nonforest, noncommercial forest, and productive forest within each Analysis Area (other than wilderness) were then generated by summing acres of condition classes from Analysis Area Reports.

A summary of the results of applying the timber suitablity data and process criteria is displayed in Table B-1.

5. ASSIGNMENTS AND SCHEDULING

The condition classes of existing vegetation were used to schedule management activities over time for the various benchmarks and alternatives.

6. MONITORING

Forest planning data provides a base from which changes can be measured. It will be used to monitor implementation activities and for evaluation of results.

7. PLAN IMPLEMENTATION PROGRAMS

The data base provides biological and physical data that will help develop subsequent programs for plan implementation. As more information is available, the data base will be updated and improved.

TABLE B-1 Tentatively Suitable Lands - Flathead National Forest

	Wilderness Acres	Other Acres	Total Acres
Total net Forest area	1,069,954	1,292,128	2,362,082
Water	31,977	52,635	84,612
Nonforest land	68,874	68,964	137,838
Forest land at least 10% stocked with trees	963,061	1,176,571	2,139,632
Forest land not capable of producing industrial wood	445,168	338,976	784,144
Productive Forest land	517,893	837,595	1,355,488
Land withdrawn from timber production by Congress or the Chief	517,893	1,848	519,741
Available productive Forest land	0	835,747	835,747
- Not technologically suited for timber production	0	0	0
Irreversible resource damage	0	0	0
Restocking not assured	0	0	0
- Tentatively suitable for timber production	0	835,747	835,747

B. SOURCES OF DATA

Sources of existing inventory data used in the analysis are as follows:

1. Forest Service Manual, Management Information Handbook (MIH 1309.11) provided definitions for outputs, activities, effects, and other information.

2. Vegetative habitat types - Maps by On, Bigler, et al.

   - Regional Vegetation Group - Forest Planning Data Base Dictionary

   - Forest Vegetation Group - Flathead National Forest Vegetation Groups from "Ecoclass Identification for Region One" by On and Losensky 1310

3. Land types were derived from landtype maps done by Al Martinson, Forest Soil Scientist, 1984.

4. Corridors -

   - Forest Service - Bonneville Power Authority Study for Potential Corridors
   - Corridors for Special-Use Permits
   - Easements and Memorandums of Understanding

5. Timber Compartments - 1976 Timber Management Planning Stand Map

6. Administrative boundaries are delineated on the Flathead National Forest Map, 1981. Ownership - Land Status Record Book. The "base area" is the area within the Flathead National Forest boundary plus all of the intermingled ownership in the lower Swan Valley.

7. Timber inventory was derived from the 1974 timber inventory (FINSYS).

8. Delineation of streams, lakes, and riparian areas.

   - Lakes - From Fisheries Biologist List of Lakes.
   - Streams - Perennial USGS Quad Map.
   - Wetland - Land Types 12 and 14-3.
   - Flood plains - Flood plain map (W&SR) for North & Middle Forks (50 year Flood plain) and landtypes 10, 10-1, 10-2, 10-3.

9. Delineation of Fish Habitat.

   Fish Habitat - Inventoried by Fisheries Biologist - Map EE (Water)
   Adfluvial Fish Habitat - Inventoried by Fisheries Biologist 1979 - Maps EE (Water)

10. Recreation -
    Recreation Opportunity Planning Guidelines 11/16/80 ROS Maps
    Current RIM Information

    Recreation Sites -
    Flathead National Forest Recreation Inventory
    Forest Plan data base
    Current RIM data (resources)
    Recreation Comsumption Forecast, Giannettino 8/81
    Social and Economic Overview, Giannettino 8/81

11. Range - Allotments were typed based on 1963-66 range allotment plan maps and general knowledge.

12. Wildlife - Completed winter range map and essential habitat map. Summer ranges subalpine fir, habitat type above 5000 feet.

    - Big-Game Winter Range Maps
    - Threatened and Endangered Species Essential Habitat Maps (Grizzly Bear, Gray Wolf, Bald Eagle, and Peregrine Falcon)

13. Mineral potential was developed utilizing the Potential Rating System for Flathead National Forest Integrated Plan (Wallace, 3/80).

    - Oil and Gas Lease Applications

14. Runoff -
    -SCS precipitation runoff map as adjusted by P. Snow, Hydrologist
    -Divide into precipitation zones. P. Snow, Hyrdrologist

15. The visual resource was mapped by Pat Thomas using the National Landscape Management, Vol. 2, USDA, Forest Service, April 1974. Revised.

16. Economics - Stumpage value was based on bidder transaction evidence for 1974 to 1980; price trends for Haynes and Adam (1980); other resource values (price trends) from 1980 RPA reports (Beasley, 1978); and costs were developed by Forest personnel as documented in planning record: Flathead National Forest Plan Data and Process Criteria for Economics Data; Economic Impact Analysis from IMPLAN 1/0 Model (1983).

17. ORV Opportunities and Restrictions - 1979 Flathead National Forest Travel Plan Map (Proposed).

18. Accessibility - Current transportation map and delineation by Transportation Planning.

19. Roadless Designation - RARE II and President's recommendation. All RARE II area on Flathead National Forest designated to nonwilderness (FS & President's recommendation).

20. Roadless Area - RARE II inventory (areas are identified on overlay B) and data base. An updated roadless inventory was added 8/83 to permit reevaluation of roadless lands (DEIS Supplement).

21. Geology - USGS, Johns and modified by P. Snow, Geologist - bedrock and surface geology. Standard Geological Codes.

22. Water Uses

23. Cultural Inventory

24. Soil, Water, and Reforestation Backlog Inventories.

CHAPTER III. THE FOREST PLANNING MODEL (FORPLAN)

A. OVERVIEW

FORPLAN is a linear programing computer model designed to analyze thousands of possible management activities, practices, and resource outputs on specific land areas. It assigns land to management prescriptions and schedules management practices over time while meeting various management constraints and a specified goal called the objective function.

The specific land areas, called analysis areas, were delineated by characteristics which have a fairly uniform response to management activities, costs, and benefits. Management activities and practices were assigned to analysis areas based on their suitability (see Part C of this section). Specific combinations of activities and outputs were assigned to analysis areas to represent various multiple-use prescriptions called management prescriptions. Each of the 512 analysis areas has an average of six different management prescriptions available for the model to assign.

Resource outputs or production coefficients were developed for each combination of analysis area and management prescription. FORPLAN assigns those management prescriptions to analysis areas which produce the goods and services that satisfy the objective function, after meeting all constraints.

Alternatives were generated by constraining management prescriptions available to analysis areas, the access to analysis areas for timber harvest in a particular decade, or the outputs from analysis areas or groups of analysis areas. These constraints were designed to achieve the goals of an alternative. The conditions set by the constraints must be satisfied before the objective function is optimized. The analysis of most of the benchmarks and alternatives used the same objective function; i.e., to maximize present net value. Some benchmarks had other objective functions that are described in Section VI.

B. THE ANALYSIS PROCESS AND ANALYTICAL TOOLS USED

Analysis leading up to FORPLAN included designing management prescriptions (planning record: Management Prescriptions), assigning practices to prescriptions developing management costs for each practice and predicting resource outputs and benefits (planning record: Coefficient Documentation). Outputs predicted include timber yield, elk forage, range forage, recreation capacity, visual quality acres, grizzly bear/gray wolf habitat index, sediment, and roads.

Cost efficiency was considered by the interdisciplinary team while they were developing a realistic and flexible set of management prescriptions. Professional judgment played a major role. FORPLAN was later used to examine the comparative cost efficiencies of a wide range of feasible prescriptions.

Practices which required analysis included road construction, road density, fuels treatment, and timber management guidelines for reforestation, silvicultural systems, logging method, and rotation age. The growth prognosis model was used to develop existing, managed, and unmanaged timber yield tables (Wykoff and others, 1981).

Major decisions that resulted from the preliminary analysis include the following that apply to all prescriptions:

a. All roads will be built and maintained to Forest-wide standards and guidelines. Variations occur by land types. Riparian areas will receive special emphasis. Costs range from $12,000-40,000/mile depending on slope and soil stability. Benefits are the conservation of soil and water.

b. Timber sales are planned and administered to Forest-wide standards and guidelines, including coordination with cultural, visual, wildlife, soil, and water resources. All harvesting is planned to meet prescription objectives, including minimum management requirements.

c. Access controls to protect wildlife and habitat maintenance and improvement were also included in appropriate prescriptions.

d. Limited livestock improvements and maintenance were included in all appropriate prescriptions.

e. Standards and guidelines along with monitoring practices will be applied in all prescriptions to protect the basic soil and water resource.

FORPLAN was used to ensure selection of the most cost-efficient management prescriptions. By maximizing Present Net Value, a cost-efficient mix of prescriptions is selected which ensures compliance with NFMA requirements which state:

> Each alternative will represent to the extent practicable the most cost-efficient combination of management prescriptions examined that can meet the objectives established in the alternative (36 CFR 219.12(f)(8)).

A social impact assessment and the identification of baseline socioeconomic conditions were developed for the local area. This analysis is discussed in V. Social and Economic Impact Analysis.

C. IDENTIFICATION OF ANALYSIS AREAS (planning record: 219.5(e) 5/81)

The rationale for delineating analysis areas is summarized in Table B-2. Each FORPLAN Criterion Level is further described in this section.

TABLE B-2 Delineation of Analysis Areas (Levels) - Flathead National Forest

Analysis Area Level	FORPLAN Level Identifier	Reason for Delineation
Ranger Districts and Current Status	1	Administrative needs and legal constraints
Roaded, Not Roaded, or Riparian	2	Differentiate between land capabilities for future management options and costs. Provides for analysis of roadless and riparian management public issues and NFMA management requirements.
Winter Range or Not Winter Range	3	Differentiate between land capabilities for analysis of winter range options and costs. Prediction of big-game carrying capacities.
Timber Productivity and Working Group	4	Prediction of timber outputs, values, and costs.
Land Class	5	Stratifies land according to physical land and soil attributes. Permits analysis of logging system and road costs, application of soil protection requirements, and assignment of management prescriptions.
Condition Class Existing	6	Provides for timber volume and value projections.
Condition Class Regenerated	7	Provides for regenerated stands to be modeled consistent with treatment of existing stands.

1. LEVEL 1 CRITERION - RANGER DISTRICT AND CURRENT STATUS

This criterion was used to identify administrative and legal boundaries including Ranger Districts, wildernesses, Wild and Scenic Rivers, and other classified areas. This criterion is used to disaggregate Forest-wide outputs and costs, and model legal constraints. Level 1 identifiers used are shown in Table B-3.

TABLE B-3 Level 1 Identifiers - Flathead National Forest

Number	Identifier	Description
1	SWANLK	Swan Lake Ranger District
2	BIGMTN	Big Mountain Ski Resort
3	BOB	Bob Marshall Wilderness
4	CORAM	Coram Experimental Forest
5	GREATB	Great Bear Wilderness
6	HHBEAR	Hungry Horse & Spotted Bear Ranger Districts
7	GLACIR	Glacier View Ranger District
8	TALLY	Tally Lake Ranger District
9	JEWBAS	Jewel Basin Hiking Area
10	MISMTN	Mission Mountains Wilderness
11	W+S	Wild and Scenic River (The three forks of the Flathead River)

2. LEVEL 2 CRITERION

This criterion was used to stratify land into the areas that are currently roaded or not roaded and to separate riparian from nonriparian lands. This was necessary in order to assign appropriate sets of alternative management prescriptions, costs, and outputs. It is responsive to issues regarding roadless recreation opportunities, road construction, and management costs including minimum management requirements. Level 2 identifiers used are shown in Table B-4.

Table B-4 Level 2 Identifiers - Flathead National Forest

Number	Identifier	Description
1	N/A	Not Applicable
2	RD	Roaded Analysis Area
3	NRD	Not Roaded Analysis Area
4	RIPARN	Riparian Area

3. LEVEL 3 CRITERION

This criterion was used to define land capable of supporting various big-game animals during the winter from land that is not capable of providing winter range forage. This separation is necessary in order to model winter range forage production and habitat requirements such as cover constraints, and to provide for proper assignments of prescriptions and economic tables. It was also used to separate winter ranges capable of timber production from those that are not. It is responsive to big-game habitat management and timber production issues. Table B-5 displays the identifiers used.

TABLE B-5 Level 3 Identifiers - Flathead National Forest

Number	Identifier	Description
1	N/A	Not applicable
2	ALL	Means all Level 4 & all Level 5 identifiers
3	NOPROD	Lands not suitable for timber
4	ELK	Elk winter range
5	EW	Elk and whitetailed deer winter range
6	WTD	Whitetailed deer winter range
7	EKNOPD	Elk winter range, not suitable for timber
8	EWNOPD	Elk & WTD winter range, not suitable for timber
9	WTNOPD	WTD winter range, not suitable for timber

4. LEVEL 4 CRITERION

This criterion is used to define biological potential of varying land groups and to separate existing stands into species working groups. The separation is necessary in order to assign proper silvicultural prescriptions, volume and value yields, and costs of alternative treatments. It is responsive to minimum management requirements and issues regarding economic efficiency of timber management practices and investments. Level 4 identifiers are shown in Table B-6.

TABLE B-6 Level 4 Identifiers - Flathead National Forest

Number	Identifier	Description
1	N/A	Not applicable
2	HI-LPP	High productivity, lodgepole pine
3	HI-MXC	High productivity, mixed conifer
4	LO-LPP	Low productivity, lodgepole pine
5	LO-MXC	Low productivity, mixed conifer
6	LO-REG	Low productivity, HRSAW and MSAW that may or may not change type

5. LEVEL 5 CRITERION

Landtype Group identifiers in Level 5 are basic to defining physical stratification of land for assigning prescriptions, management practices, economic tables, and constraints in FORPLAN. This criterion is responsive to minimum management requirements and to the issues of road construction and alternative logging method cost efficiency analysis, land suitabilities for timber, range, recreation, sediment production, and management costs. Level 5 Criterion are shown in Table B-7.

TABLE B-7 Level 5 Identifiers - Flathead National Forest

Number	Identifier	Description
1	N/A	Not applicable
2	+40%	Landtype groups 5, 10, 12, 14, 15, 16
3	-40%	Landtype groups 4, 6, 7, 9, 11
4	-40NS	Under 40% slope nonsensitive soils
5	-40SC	Under 40% slope sensitive to compaction
6	-40SSW	Under 40% slope sensitive to shelterwood
7	+40NS	Over 40% slope nonsensitive soils
8	+40SRD	Over 40% slope sensitive to roading
9	+60NS	Over 60% slope nonsensitive soils

6. EXISTING CONDITION CLASS CRITERION

This criterion was used to identify existing timber conditions on the Forest. This information was used to predict response coefficients for timber, cover/forage relationships, old growth, grazing, and management costs. It is responsive to timber, wildlife, and grazing issues. Condition, size, and stocking classes were aggregated into the condition classes shown in Table B-8.

TABLE B-8 Condition Class Criterion - Existing Vegetation - Flathead National Forest

Number	Identifier	Description
1	N/A	Not Applicable
2	HRSAW	High Risk Sawtimber
3	MSAW	Mature Sawtimber
4	POLES	Poles
5	STAG	Stagnated Stands
6	SESAP	Seedlings and Saplings
7	NST	Nonstocked Lands
8	NCFNF	Noncommercial and Nonforest
9	ALL	All Condition Classes

7. REGENERATED CONDITION CLASS CRITERIA

This criterion was used to link regenerated stands to the same logging method and appropriate road densities and management costs as the existing timber stand. This was necessary to assure the alternative logging system and road density was consistent in the economic analysis for undeveloped analysis areas. It is responsive to timber economics and road construction issues. Regenerated condition class criteria are shown in Table B-9.

TABLE B-9 Regenerated Condition Class Criteria - Flathead National Forest

Number	Identifier	Description
1	EVSKY1	Even-aged; 1000' Skyline
2	EVSKY2	Even-aged; 2000' Skyline
3	EVTRAC	Even-aged; Tractor
4	EVJAM	Even-aged; Jammer
5	EVHELI	Even-aged; Helicopter
6	UVSKY1	Uneven-aged; 1000' Skyline
7	UVHELI	Uneven-aged; Helicopter

D. IDENTIFICATION OF PRESCRIPTIONS

1. OVERVIEW

NFMA regulations define management prescriptions as "management practices and intensities selected and scheduled for application on a specific area to attain multiple use and other goals and objectives" (36 CFR 219.3). Generally, a management prescription is a set of treatments or practices to develop and/or protect some combination of resources on a particular land type.

2. DESIGN OF MANAGEMENT PRESCRIPTIONS

The following points summarize the Flathead National Forest's management prescription development process:

> Upon finalizing the list of issues and concerns that the Forest Plan addresses, "issue analysis committees" were formed. Among other things, these committees identified issues and facets of issues that require land designation decisions for their resolution. These issues became focal points for ID team members in the initial stages of prescription development. Requirements of the NFMA further indicated facets of Forest management that needed to be analyzed by exploring the effects of designating portions of the Forest to varying intensities of resource management.
>
> The ID team prepared a list of cost-efficient, multiple-use prescriptions along with a broad goal statement for each of three management intensities (low, moderate, and high) for the principal management emphasis of the prescription.
>
> The core team developed a prescription preparation format that provided for the following information: resource or support element; desired future condition; management practices and activities (outputs); and standards and guidelines. Spreadsheets were prepared for each intensity level for each management emphasis. Stated at the top of the sheet was the broad goal statement.

The spreadsheets were circulated to ID team specialists who provided details in their area of specialty for each prescription. Specialists addressed their functions at the same intensity level as indicated for the principal management emphasis. For example, under a high intensity management emphasis for whitetailed deer winter range, the recreation specialist indicated the desired future condition for recreation opportunities and uses, management activities and outputs, and standards and guidelines assuming high intensity recreation management, but compatible with and relative to the principal emphasis of whitetailed deer winter range management.

Completed prescriptions received full review, discussion, and revision as necessary by the ID team. For the ID team review, the core team prepared the following criteria against which the ID team evaluated each prescription:

a. Does the prescription adequately convey what the desired future condition will be of land managed under it?

b. Does the prescription provide the technical management direction needed by a land manager to achieve the stated future condition?

c. Does the prescription provide the information needed for developing costs and outputs for FORPLAN?

d. Does the prescription address the planning issues and concerns?

To fully explore appropriate and practical ways of managing the Forest for a variety of resource uses, cost-efficiency considerations were used to guide the development and assignment of management prescriptions to various parts of the Forest (referred to as "analysis area" in FORPLAN). Within the rules and limitations of the model, the team considered all management prescriptions appropriate for each of the analysis areas on the Forest. The team based the assignment of management prescriptions on the land's inherent capability for resource production as defined by landtype and habitat type guidelines.

Prescriptions were designed to explore a full array of management options. Current management practices were described in the prescriptions to define practical and reasonable methods of implementing management. In addition, certain prescriptions were designed to maximize production of individual outputs, given the constraints of protecting all other resources at minimum legal or biological levels. This permitted analysts to study the productive potential of the Forest. True multiple-use prescriptions are also used to address land use conflicts, issues, and concerns. Prescriptions must be created so that the relative cost efficiency of alternatives can be explored.

"Cost-efficient use" of Forest land may be achieved by: (1) managing some areas of land for several purposes simultaneously; (2) managing some areas of land with a single output emphasis; and (3) leaving some areas of land in a minimal state of management. In order to find a cost-efficient management pattern, each of these three types of prescriptions was an option for each land type represented in the model.

From this basic set of management prescriptions applied to the land, the Forest team developed yield and cost tables for use in modeling each prescription in FORPLAN. These prescriptions were used for the development of both benchmarks,and alternatives after additional screening to ensure the cost efficiency of the prescriptions necessary for development of cost-efficient alternatives.

Alternatives having similar outputs for some resources may differ widely in how the land is assigned to various prescriptions and in where the assignments take place. These differences are apparent when comparing the alternative maps.

3. PURPOSE, CRITERION, AND ASSUMPTIONS FOR PRESCRIPTION CATEGORIES

The prescriptions can be grouped into general categories by major resource element or application. The categories are recreation, visual, wilderness, timber, riparian, wildlife (including threatened and endangered) habitat, special areas, and custodial management.

The purposes of specific prescriptions within each category are to portray a management activity presently being practiced on the Forest, to respond to a particular issue or group of issues, and to provide a range of management options that could be applied to various land areas.

Mathematical relationships existing between prescriptions are also examined. This information is useful in the explanation of tradeoffs that occur when numerous prescriptions interact within individual alternatives. Forest planning records contain detailed information.

a. Recreation Category

(1) Purpose

The recreation prescription category was developed to respond to the issue of where and to what extent the Flathead National Forest should be managed for specific types of recreational activities.

(2) Criteria and Assumptions

- Provide developed recreation opportunities, including campgrounds, picnic areas, winter sports areas, etc. Developed site prescriptions address full-service and reduced-service level management options.

- Provide dispersed recreation, including emphasis on trail construction, reconstruction, and maintenance. All management prescriptions in this category address low, moderate, and high management intensity levels for recreation appropriate for each prescription's emphasis.

- In addition to prescriptions that emphasize dispersed and developed recreation, special prescriptions were developed for management of Wild and Scenic Rivers, Big Mountain Ski Area, and Jewel Basin Hiking Area.

b. Visual Category

(1) Purpose

The category of visual management prescriptions was developed to address the major issue of VQO (visual quality objectives) pertaining to timber harvest operation for viewing areas within the Flathead National Forest. The purpose was to provide an array of options for timber harvesting which would include VQO's for retention and partial retention which could be used to examine tradeoffs and cost efficiency. Each management prescription includes a visual quality objective appropriate for that prescription's management emphasis.

(2) Criteria and Assumptions

- Use the basic concepts and research findings contained in the USDA Forest Service Handbook (No. 462) and appropriate current silvicultural practices.

- Design the prescriptions to provide for other resource uses compatible with timber production under retention and partial retention VQO's.

- Develop standards, guidelines, and costs using commonly accepted management practices currently in use.

c. Wilderness Category

(1) Purpose

The category of wilderness prescriptions was developed to address the issue of how to manage the Forest's three existing wildernesses, including trail maintenance and fire management.

(2) Criteria and Assumptions

The wilderness management prescriptions (developed coordinately with the Lewis and Clark and Helena National Forests for the Bob Marshall and Great Bear Wildernesses) address all facets of this issue at two intensity levels.

The same prescriptions were applied to all proposed wilderness additions.

d. Timber Category

(1) Purpose

The category of timber prescriptions was developed to respond to the issues regarding: what the sustained yield timber harvest level for the Flathead National Forest should be, what timber harvest, silvicultural, and reforestation methods should be used; and what utilization standards the Flathead National Forest should require in order to achieve optimum utilization of wood fiber?

(2) Criteria and Assumptions

- Timber management prescriptions include goal statements, management activities, and standards and guidelines that allow the Forest to explore a full range of appropriate timber management practices, within technical and ecological limits, along with their associated costs.

- Allow in the FORPLAN model only those harvest methods, cultural practices, and yields that are compatible with the biological and physical capabilities of the land comprising each analysis area. (Landtype and habitat type standards and guidelines provide the basic framework for defining land capabilities for assignment of prescriptions.)

- Array a wide range of technically feasible management options, their costs, and output values for analysis in FORPLAN subject to maximizing present net worth of the Forest.

- Define timber harvest yields compatible with other resource outputs. Different levels of harvest result from different combinations of resource management emphasis constraints and management intensities over time.

- Apply the utilization standards recommended in the Northern Regional Plan's preferred alternative.

e. Riparian Category

(1) Purpose

Riparian prescriptions were developed to protect the water quality and riparian habitat on the Flathead National Forest and to respond to executive orders regarding flood plains and wetlands.

(2) Criteria and Assumptions

Provide a range of intensities for riparian area management from limited timber production aimed at riparian zone protection, to prescriptions that include production of timber. Use output coefficients and standards and guidelines to track the effects of alternatives on species groups dependent on riparian habitat.

f. Wildlife (Including Threatened and Endangered) Habitat Category

(1) Purpose

This category was developed to address the issue of how much and what type of habitat should the Flathead National Forest provide for diverse fish and wildlife species, including those classified under the Endangered Species Act.

(2) Criteria and Assumptions

- All management prescriptions contain goal statements, output coefficients, management costs, and standards and guidelines for elk, mule deer, and whitetailed deer winter habitat. A series of prescriptions specifically address these species.

- Bald eagle and peregrine falcon habitat management are addressed in a Forest policy statement.

- Management prescriptions include considerations of grizzly bear and gray wolf habitat management guidelines relative to each prescription's management emphasis. In addition, a series of prescriptions emphasize bear and wolf habitat management. The outputs and effects of any combination of resource management emphases are assessed by means of grizzly bear/wolf index values in FORPLAN.

g. Special Areas Category

(1) Purpose

Special area category prescriptions were developed for application to lands set aside to protect their unique characteristics or for administrative purposes.

(2) Criteria and Assumptions

Research Natural Areas - These prescriptions were designed to provide continued management of existing special areas, such as the Coram Research Natural Area and an option for designating additional areas for the same type of management.

Jewel Basin Hiking Area - Prescriptions address low, moderate, and high management intensity levels for protection of the unique backcountry resources found in this area.

Administrative Sites - Prescriptions provide for maintenance of existing facilities at various levels of intensity.

h. Custodial Category

(1) Purpose

Prescriptions were developed for application to nonforest or forested lands not suitable for timber production due to low productivity, economics, or geographic isolation problems. Included in this category is a minimum level of custodial management prescription for lands that are to be managed in their current state, deferring investment in timber production for the Plan period.

(2) Criteria and Assumptions

Provide for a mix of uses, excluding scheduled timber management, that are compatible with surrounding land designation and minimum costs.

4. USE OF COST EFFICIENCY IN DEVELOPING PRESCRIPTIONS

Cost efficiency was considered in developing prescriptions in the following manner: objectives, standards, and guidelines were established for each prescription by resource element. Given the objective of the prescription, costs were estimated for resource elements to meet the standards or guidelines of the prescription. Costs of producing the outputs that would result from implementing the prescription were developed and compared to the benefits produced. Prescriptions were carried forward if they were cost efficient in achieving prescription goals.

Two basic assumptions used in developing prescription costs were: costs experienced in implementing past practices were a reasonable basis from which to predict future costs, and the funding for production of outputs would include only the necessary funding.

5. LIST OF PRESCRIPTIONS

The following management prescriptions were used to formulate alternatives for the Flathead National Forest. Displayed below are abbreviated goal statements for each prescription. In addition, each prescription contained descriptions of the desired future condition and management direction for each resource element. Standards and guidelines, management practices and activities, and more detailed management prescriptions are available for review in the Forest Supervisor's Office, Kalispell, Montana. The abbreviations that follow the name of each prescription are the codes for the FORPLAN report writer computer runs.

MINIMUM MANAGEMENT (MINLVL)

GOAL: Protect resources and existing improvements with minimal investment.

DISPERSED RECREATION LOW INTENSITY (DISREC LOW)

GOAL: Provide dispersed recreation opportunities in both roaded and unroaded environments with passive management of all resource systems. Maintain existing facilities and manage use only to protect soil, water, and other resources.

DISPERSED RECREATION MODERATE INTENSITY (DISREC MOD)

GOAL: Provide dispersed recreation opportunities in both roaded and unroaded environments with active management of all resource systems compatible with dispersed recreation management. Maintain all facilities and manage use in coordination with other compatible activities to provide a full range of opportunities.

DISPERSED RECREATION HIGH INTENSITY (DISREC HIGH)

GOAL: Provide dispersed recreation opportunities in both roaded and unroaded environments with active "state of the art" technology and improvements necessary to increase production of all resource systems. Increase facilities with complete maintenance and management of use necessary to reduce conflicts and provide additional dispersed recreation opportunities.

DEVELOPED RECREATION DISINVESTMENT (DEVREC DISINVEST)

GOAL: Close developed recreation sites and remove facilities as they deteriorate. Protect soil, water, and other resources.

DEVELOPED RECREATION - REDUCED SERVICE (DEVREC REDUS)

GOAL: Provide for developed recreation with management to the reduced-service level of existing sites. Protect soil, water, and other resources.

DEVELOPED RECREATION - FULL-SERVICE (DEVREC FULLS)

GOAL: Provide for developed recreation with full-service level management of existing sites.

AMENITY VALUES (AV)

GOAL: Manage to maintain or enhance amenity values which include nongame species, visual quality, old growth, and water quality without construction of roads or scheduled timber harvest.

VISUAL MANAGEMENT RETENTION LOW INTENSITY - WITH ROADS (RETRD LOW)

GOAL: Meet a retention VQO while managing for timber production with roads. Maintain facilities and manage use and management activities to protect the basic productivity and remain consistent with the retention visual quality objectives.

VISUAL MANAGEMENT RETENTION MODERATE INTENSITY - WITH ROADS (RETRD MOD)

GOAL: Meet a retention VQO while managing for timber production with roads. Make full use of existing productive capacity, and manage other resources while remaining consistent with the retention visual quality objective.

VISUAL MANAGEMENT RETENTION HIGH INTENSITY - WITH ROADS (RETRD HIGH)

GOAL: Meet a retention VQO while managing for timber production with roads. Employ "state of the art" technology for all resources compatible with visual management objectives, incorporating the additional investments and operating practices necessary to increase all resource production levels.

VISUAL MANAGEMENT RETENTION LOW INTENSITY - WITHOUT ROADS (RETNRD LOW)

GOAL: Meet a retention VQO while managing for timber production without roads. Maintain facilities and manage use and activities to protect the basic productivity and remain consistent with the retention visual quality objective.

VISUAL MANAGEMENT RETENTION MODERATE INTENSITY - WITHOUT ROADS (RETNRD MOD)

GOAL: Meet a retention VQO while managing for timber production without roads. Make full use of existing productive capacity, and manage all resources while remaining consistent with the retention visual quality objective.

VISUAL MANAGEMENT PARTIAL RETENTION LOW INTENSITY - WITH ROADS (PRETRD LOW)

GOAL: Meet a partial retention VQO while managing for timber production with roads. Maintain facilities and manage use and activities to protect the basic productivity and remain consistent with the partial retention visual quality objective.

VISUAL MANAGEMENT PARTIAL RETENTION MODERATE INTENSITY - WITH ROADS (PRETRD MOD)

GOAL: Meet a partial retention VQO while managing for timber production with roads. Make full use of existing productive capacity for all resources while remaining consistent with the partial retention visual quality objective.

VISUAL MANAGEMENT PARTIAL RETENTION HIGH INTENSITY - WITH ROADS (PRETRD HIGH)

GOAL: Meet a partial retention VQO while managing for timber production with roads. Employ "state of the art" technology for all resources compatible with the partial retention visual quality objective. Incorporate additional investments and operating practices necessary to increase all resource production levels.

VISUAL MANAGEMENT PARTIAL RETENTION LOW INTENSITY - WITHOUT ROADS (PRETNR LOW)

GOAL: Meet a partial retention VQO while managing for timber production without roads. Maintain facilities and manage use and activities to protect the basic productivity and remain consistent with the partial retention visual quality objective.

VISUAL MANAGEMENT PARTIAL RETENTION MODERATE INTENSITY - WITHOUT ROADS (PRETNR MOD)

GOAL: Meet a partial retention VQO while managing for timber production without roads. Make full use of existing productive capacity for all resources while remaining consistent with the partial retention visual quality objective.

WHITETAILED DEER WINTER HABITAT LOW INTENSITY (WTDEER LOW)

GOAL: Provide the size, diversity, and distribution of habitat units (both cover and forage areas) that is optimum for whitetailed deer winter habitat through appropriate timber management practices. Manage all other resources consistent with whitetailed deer winter habitat direction.

WHITETAILED DEER WINTER HABITAT - MODERATE INTENSITY (WTDEER MOD)

GOAL: Provide the size, diversity, and distribution of habitat units (both cover and forage areas) that is optimum for whitetailed deer winter habitat through appropriate timber management practices and low investment habitat improvement practices. Manage all other resources consistent with whitetailed deer winter habitat direction.

WHITETAILED DEER WINTER HABITAT HIGH INTENSITY (WTDEER HIGH)

GOAL: Provide the size, diversity, and distribution of habitat units (both cover and forage areas) that is optimum for whitetailed deer winter habitat through appropriate timber management practices and high investment habitat improvement practices. Manage all other resources consistent with whitetailed deer winter habitat direction.

GRIZZLY BEAR LOW INTENSITY (GBEAR LOW)

GOAL: Maintain grizzly bear habitat by controlling management activities and public use to minimize impacts.

GRIZZLY BEAR HIGH INTENSITY (GBEAR HIGH)

GOAL: Maintain and enhance grizzly bear habitat by scheduling management and investment activities and controlling public use.

RIPARIAN WILDLIFE LOW INTENSITY (RIPARW LOW)

GOAL: Protect riparian areas by controlling activities that lower the existing quality of water, wildlife, and fish habitat. Timber harvest would not be scheduled.

RIPARIAN WILDLIFE MODERATE INTENSITY (RIPARW MOD)

GOAL: Manage riparian area vegetation to provide a well-established understory and overstory for diverse wildlife and fish habitat and maintain water quality. Timber harvest would not be scheduled.

RIPARIAN WILDLIFE HIGH INTENSITY (RIPARW HIGH)

GOAL: Enhance riparian areas to provide maximum diversity and density understory and overstory vegetation. Increase wildlife and fish habitat by implementing management practices to increase productivity. Maintain water quality. Timber harvest would not be scheduled.

RIPARIAN AREA TIMBER MANAGEMENT LOW INTENSITY (RIPART LOW)

GOAL: Maintain a sustained yield harvest of timber while at the same time protecting and maintaining riparian zone fish and wildlife values. Use primarily uneven-aged harvest and silvicultural systems.

MULE DEER AND ELK WINTER HABITAT LOW INTENSITY (MDELK LOW)

GOAL: Provide the size, age, diversity, and distribution of habitat units (both cover and forage areas) that is optimum for mule deer and elk winter habitat through appropriate timber management practices. Manage all other resources consistent with mule deer an elk winter habitat direction.

MULE DEER AND ELK WINTER HABITAT MODERATE INTENSITY (MDELK MOD)

GOAL: Provide the size, age, diversity, and distribution of habitat units (both cover and forage areas) that is optimum for mule deer and elk winter habitat through appropriate timber management practices and low investment habitat improvement practices. Manage all other resources consistent with mule deer and elk winter habitat direction.

MULE DEER AND ELK WINTER HABITAT HIGH INTENSITY (MDELK HIGH)

GOAL: Provide the size, age, diversity, and distribution of habitat units (both cover and forage areas) that is optimum for mule deer and elk winter habitat through appropriate timber management practices and high investment habitat improvement practices. Manage all other resources consistent with mule deer and elk winter habitat direction.

TIMBER LOW INTENSITY WITH ROADS (TIMBRD LOW)

GOAL: Emphasize cost effective production of timber using primarily final harvest. Employ even-aged management and silviculture systems emphasizing natural regeneration with no species or stocking control. Maintain facilities and manage other resources and public use to protect basic productivity, consistent with timber management objectives.

TIMBER MODERATE INTENSITY WITH ROADS (TIMBRD MOD)

GOAL: Emphasize cost-effective production of timber with practices to maintain facilities and to make full use of existing productive capacity. Multiple entry, even-aged management will be emphasized to achieve desired stocking level and species composition. Other resources and public use will be managed consistent with timber management objectives.

TIMBER WITHOUT ROADS LOW INTENSITY (TIMBNR LOW)

GOAL: Emphasize cost-effective production of timber using roadless harvest methods and primarily a final harvest. Employ even-aged management and silviculture systems emphasizing natural regeneration with no species or stocking control. Maintain facilities and manage other resources and public use to protect basic productivity, consistent with timber management objectives.

TIMBER WITHOUT ROADS MODERATE INTENSITY (TIMBNR MOD)

GOAL: Emphasize cost-effective production of timber using roadless harvest methods. Make full use of existing productive capacity. Multiple entry, even-aged management will be emphasized to achieve desired stocking level and species composition. Other resources and public use will be managed consistent with timber management objectives.

CORAM EXPERIMENTAL FOREST (CORAM)

GOAL: Continue management within the framework established by the Memo of Understanding. The Hungry Horse District Ranger is responsible for carrying out the agreement.

FLATHEAD WILD AND SCENIC RIVER LOW INTENSITY (RIVER LOW)

GOAL: Manage each stretch of the Flathead Wild and Scenic River Unit in a manner consistent with the classification assigned to it by Public Law 94-486, the designating Act. Maintain existing facilities. Manage use to protect basic resource values.

FLATHEAD WILD AND SCENIC RIVER MODERATE INTENSITY (RIVER MOD)

GOAL: Manage each stretch of the Flathead Wild and Scenic River Unit in a manner consistent with the classification assigned to it by Public Law 94-486, the designating Act. Actively manage all resources consistent with river management direction.

FLATHEAD WILD AND SCENIC RIVER HIGH INTENSITY (RIVER HIGH)

GOAL: Manage each stretch of the Flathead Wild and Scenic River Unit in a manner consistent with the classification assigned to it by Public Law 94-486, the designating Act. Employ "state of the art" technology and improvements necessary to achieve optimum output of all resource systems. Increase facilities with full-service maintenance and manage public use to reduce user conflicts and protect river values.

JEWEL BASIN HIKING AREA LOW INTENSITY (JBHA LOW)

GOAL: Maintain existing facilities, manage hiking activities, and provide the minimum services necessary consistent with the Jewel Basin Hiking Area Management Plan and CFR 294.

JEWEL BASIN HIKING AREA MODERATE INTENSITY (JBHA MOD)

GOAL: Provide complete maintenance on facilities intensively manage use, and emphasize protection of the backcountry resources and visitors through visitor information services, consistent with the Jewel Basin Hiking Area Management Plan and CRF 294.

JEWEL BASIN HIKING AREA HIGH INTENSITY (JBHA HIGH)

GOAL: Provide complete maintenance and rehabilitation of facilities, intensively manage use and provide complete visitor information services. Manage under CFR 294 and the Jewel Basin Hiking Area Management Plan.

BIG MOUNTAIN WINTER SPORTS AREA (BIGMT)

GOAL: In cooperation with the Area Operator, administer the area and manage the resources as directed in the Special-Use Permit and the 2300, 2700, and 7700 sections of the Forest Service Manual.

WILDERNESS - REDUCED-SERVICE LEVEL (WILD LOW)

GOAL: Manage for wilderness values at a low investment level through a passive management program.

WILDERNESS - FULL-SERVICE LEVEL (WILD HIGH)

GOAL: Manage for wilderness values through a high level of investment in trails and a high level of public information and visitor contacts to minimize human impacts.

Prescriptions are compared in Table B-10 to the Forest-wide standards.

TABLE B-10 Comparisons of Prescriptions to Forest-wide Standards - Flathead National Forest

	Roads Permitted	Regulated Harvests	Timber Management			Grazing Permitted	Firewood Harvesting	Visual* Quality Objective	Recreation* ROS Class
			Reforest. Within 5 Years	Rotation Period	Size of Opening Acres				
Minimum Management	Yes	No	No	N/A	N/A	Yes	Yes	None	None
Dispersed Recreation	No	No	N/A	N/A	N/A	Yes	Yes	Ret	SPN,SPM
Developed Recreation	Yes	No	N/A	N/A	N/A	No	No	Ret	RN
Amenity Values	No	No	No	N/A	N/A	Yes	Yes	Ret	SPN,SPM
Visual Management Retention With Roads	Yes	Yes	Yes	80-120	5-10	Yes	Yes	Ret	RN
Visual Management Retention Without Roads	Yes	Yes	Yes	80-120	5-10	Yes	Yes	Ret	SPN, SPM
Visual Management Partial Retention With Roads	Yes	Yes	Yes	80-120	15-30	Yes	Yes	PRet	RN
Visual Management Partial Retention Without Roads	Yes	Yes	Yes	80-120	10-15	Yes	Yes	PRet	SPN, SPM
Whitetailed Deer Winter Habitat - Regulated	Yes	Yes	Yes	80-120	5-10	Yes	Yes	PRet	RN
Whitetailed Deer Winter Habitat - Unregulated	Yes	No	N/A	N/A	N/A	Yes	Yes	PRet	RN
Grizzly Bear Habitat With Timber Harvest	Yes	Yes	Yes	80-120	30-40	Yes	Yes	M-MM	RN
Grizzly Bear Habitat Without Timber Harvest	Yes	No	N/A	N/A	N/A	Yes	Yes	M-MM	RN
Riparian Wildlife	Yes	No	N/A	N/A	N/A	Yes	No	PRet	RN
Riparian Timber	Yes	Yes	Yes	80-120	0-2	Yes	No	PRet	RN
Mule Deer and Elk Winter Habitat - Regulated	Yes	Yes	Yes	80-120	30-40	Yes	Yes	M-MM	RN
Mule Deer and Elk Winter Habitat - Unregulated	Yes	No	N/A	N/A	N/A	Yes	Yes	M-MM	SPM
Timber With Roads	Yes	Yes	Yes	80-120	30-40	Yes	Yes	M-MM	RN
Timber Without Roads	Yes	Yes	Yes	80-120	30-40	Yes	Yes	M-MM	SPM
Coram Experimental Forest	Yes	No	N/A	N/A	N/A	No	No	None	RN
Wild and Scenic River	Yes	No	N/A	N/A	N/A	Yes	No	Ret	Prim, SPN
Jewel Basin Hiking Area	No	No	N/A	N/A	N/A	No	No	Ret	SPN
Big Mountain Winter Sports	Yes	No	N/A	N/A	N/A	No	No	M-MM	RN
Wilderness	No	No	N/A	N/A	N/A	Yes	No	P	Prim

* Ret = Retention
PRet = Partial Retention
M-MM = Modification/Maximum Modification
P = Preservation
SPN = Semi-Primitive Nonmotorized
SPM = Semi-Primitive Motorized
RN = Roaded Natural
Prim = Primitive

E. DEVELOPMENT OF TIMBER HARVEST OPTIONS/INTENSITIES

Timber yields were quantified in the FORPLAN mathematical model for various possible treatments to be applied to existing and regenerated timber stands. The stands occupy variable sites which were stratified into productivity classes. Site productivity class was determined by Habitat Type groups. Productivity ratings were assigned to Habitat Groups based on Pfister's work (Pfister, 1977) as adjusted by correlating 1974 Flathead Timber inventory site index data to habitat type group by Bigler and On (1975).

Table B-11 displays the possible management practices for which FORPLAN timber yield tables were developed using the general methodology and yield curves described below.

TABLE B-11 Silvicultural Treatment Options Available in FORPLAN - Flathead National Forest

	Productivity Class Group					
	I and II			III and IV		
Management Intensity Option -	Low	Mod	High	Low	Mod	High
Silvicultural Treatment Options:						
Existing Stands						
One Precommercial Thinning		X	X		X	X
More than One Precommercial Thinning			X			X
One Commercial Thinning		X	X		X	X
More than One Commercial Thinning			X			X
Shelterwood 2 Step Harvest	X	X	X	X	X	X
Shelterwood 3 Step Harvest			X			X
Clearcut and Seed Tree Harvest	X	X	X	X	X	X
Group Selection Harvest	X	X	X	X	X	X
Tree Selection Harvest	X	X	X	X	X	X
Rehabilitate and Plant			X			X
Regenerated Stands						
Plant Production Stock		X	X		X	X
One Precommercial Thinning		X	X		X	X
More than One Precommercial Thinning			X			X
One Commercial Thinning		X	X		X	X
More than One Commercial Thinning			X			X
Shelterwood 2 Step Harvest	X	X	X	X	X	X
Shelterwood 3 Step Harvest			X			X
Clearcut and Seed Tree Harvest	X	X	X	X	X	X
Group Selection Harvest	X	X	X	X	X	X
Tree Selection Harvest	X	X	X	X	X	X

F. DEVELOPMENT OF YIELD COEFFICIENTS

1. OVERVIEW

This section describes how the yields of each resource were calculated. Additional information regarding each resource can be found in the respective background papers on file in the Forest planning records.

2. TIMBER

The Flathead National Forest used a combination of data from the Growth Prognosis Model and the 1978 Flathead Empirical Yield Tables to generate Timber Yield Coefficients for use in FORPLAN. Growth prognosis was used for existing sawtimber and pole stands to generate basic yield curves. Empirical yield tables were used for seedling, sapling, and regenerated stands and for commercial thinning yields. The advantages of utilizing this strategy are:

- It minimizes cost and time necessary to generate local Flathead volume tables by utilizing technically appropriate data currently available.
- All volume tables reflect timber stand grouping and productivity classes compatible with stratification used for Flathead National Forest Plan data base and FORPLAN Analysis Areas.
- All volume tables are based on 1974 Flathead Timber Inventory statistics.
- Necessary detail for economic analysis between timber condition classes and species working groups was provided.
- Yield estimates were available for silvicultural treatment options to be responsive to a wide range of management intensity and land use options for each timber class.

a. Timber Yield for Existing Timber Stands

Existing timber stands were classified into condition classes and working groups as defined in Hodgeboom's 1920 memo dated April 18, 1980. Aggregating of the condition classes and working groups in FORPLAN was necessary due to limitations on number of analysis area/prescription combinations which can be accommodated in the computer program. Details of the aggregating which was necessary in the final set tables used in FORPLAN is discussed in the Flathead National Forest Analysis Area Process Criteria paper.

Weighted average composite yield curves were developed for each condition class/working group/productivity class group for saw timber and pole stands. The yield curves were developed by using 1974 Timber inventory data describing individual trees on each sample plot as a basis for a computer program (Stage, 1973) to predict future growth and stand volumes. For each stand modeled, the computer program predicts the growth and probability of mortality for each tree record based on data from measured trees of similar kind and site throughout western Montana. The growth rates predicted by the built-in models for diameter change were compared to the actual past growth of the sample trees to calibrate these models for the particular stand for which the prognosis was to be computed. The individual tree records for each stand are compiled at the end of each 10-year growth period and statistical estimates of stand parameters (average trees/acres, total cubic ft. volume, growth,, and mortality) are displayed (Stage, 1973). The volume per acre at the end of each decade can be plotted against stand age to produce a predicted yield curve for each stand. The Mountain Pine Beetle Mortality Model is linked to the Prognosis Model to incorporate estimates of mortality due to beetles in lodgepole pine stands. The plotted points for all stands in a condition class/working group/productivity class group can be plotted or weighted by mathematical procedures to produce an average yield curve for all stands in the group. A computer program was designed by Ralph Johnson, RO Division of Timber Management, to construct weighted average composite yield tables for all stands in a group. After examining the growth prognosis output for each stand to assure that useful data was produced, the stands with data to be incorporated into a composite yield table were submitted to the composite program. All sampled stands which would project with the prognosis model were used except a few stands with only one tree record in the sample data (these produce unreliable data).

Due to the fact that the growth functions in the Prognosis Model do not handle small trees well (trees less than 4" d.b.h.), yield tables for seedling and sapling existing condition classes were derived from empirical yield data developed by Bigler, 1978. Also, the model does not handle dense stagnated stands well. The calibration feature of the model apparently does not modify the growth and mortality functions in the model sufficiently to account for the unique conditions of highly overstocked stands. Therefore, the stagnated condition classes were assumed to be in a state where merchantable growth and mortality are approximately equal and that existing volume will not change until the stands are modified by cultural treatment.

The timber yield data was stratified into two species working groups for use in FORPLAN analysis: lodgepole pine and mixed conifer types. These curves for each condition class/productivity class group were used in a manner similar to that used to build yield tables for 1978 MUSYC timber classes (Bigler, 1978). The same methodology for checking growth prognosis projections using well-stocked empirical yield curves for establishing lower cutting limits and growth for commercial thinnings, and for deriving shelterwood and selection harvest cuts, were applied.

The basic assumptions underlying the use of these curves are that the yields predicted by projecting and averaging measured sample stand data which reflect existing stocking will better predict actual future yields than data based on site potentials for existing stands, and that 20-year potential occurrence of sound dead and mortality can be removed in advance through thinnings without adversely affecting the growth of residual stands.

See Table B-12 for yield estimates for existing timber stands.

TABLE B-12 Timber Yield - Flathead National Forest

Condition Class	M Board Feet/M Cubic Feet Per Acre HT1234 Low Productivity	M Board Feet/M Cubic Feet Per Acre HT567 High Productivity
First Decade Existing timber		
Mixed High Risk Sawtimber	8.7 / 1.9	18.1 / 3.9
LPP High Risk Sawtimber	10.9 / 2.7	14.1 / 3.7
Mixed Mature Sawtimber	11.3 / 2.6	14.7 / 3.3
LPP Mature Sawtimber	8.8 / 2.5	8.4 / 2.2
Mixed Poletimber	3.2 / 1.9	2.1 / 0.9
LPP Poletimber	2.8 / .9	3.3 / 1.5

b. Timber Yields for Regenerated Stands

The empirical yield curves developed by Bigler (1978) were used to model regenerated stands. A brief sumary of the methodology and assumptions used in deriving these curves is outlined below.

(1) Managed Regenerated Stands

For managed stands, the yield curve was derived by fitting a curve to the gross cubic foot volume of selected stands sampled in the 1974 Timber inventory which appear to model a managed stand. (The criteria for selection are that the stand is near optimally stocked in relation to stand age, and other stand parameters of volume, growth, mortality, basal area, average number and size of trees indicate the stand has been relatively free to grow at site potential since its establishment.) The record of selected stands by stand number, age, and volume for each productivity class and species working group, along with the regression analysis for curve fitting, are contained in a notebook entitled "Yield Curve Data" filed with the 1974 Timber Inventory Data. The assumption underlying the use of these curves is that observed growth and yields which could be obtained from existing natural stands which developed with natural stocking control can be attained through artificial stocking control.

These basic managed stand empirical yield curves represent the volume/age trajectory which would result from natural growth and mortality in stands set on that course through one or more precommercial thinnings. The lower cutting limits representing the reduction of growing stock at a given age to model a commercial thinning are established by an amount equal to the expected mortality occurrence for two decades in advance of the age of the thinning entry. Expected mortality is established by fitting a curve to measured 10-year mortality vs. stand age for the same stands as those selected for the standing live volume vs. age managed stand curve. Ten-year mortality is computed by adding the sound dead and mortality per acre from the TREND stand information printout for each stand.

The growth rate for the residual stand to follow after commercial thinning was computed by plotting observed periodic annual increment vs. age for the stands selected to model managed stands for each productivity class and species working group. These growth curves are used to determine the number of years required for the residual stand to regrow to full stocking represented by the "Natural Mortality Curve" for managed stands. The assumption underlying the use of managed stand yield curves with commercial thinning is that 20-year potential occurrence of sound dead and mortality can be removed in advance through thinning without adversely affecting the growth of the residual stand.

The volumes and growing stock levels predicted by managed stand yield curves constructed using the above methodology were checked using two methods. First, some young stands which have had a precommercial thinning for which stand examination data was available after thinning were submitted to a growth prognosis of future commerical thinning. The computer model yields were then compared to yields from the empirical yield curves for a similar management regime and found to be comparable for many stands. Second, the residual growing stock levels modeled by the lower cutting limits of the empirical yield tables for managed stands compared favorable to the 45 percent of normal basal area recommended in the "Larch Management Guides" contained in USDA FS Technical Bulletin No. 1520 (Bigler, 1978).

No estimates of yields expected to result from implementing practices of forest fertilization or use of genetically improved stock are made, in accordance with Northern Region policy.

(2) Unmanaged Regenerated Stands

A procedure similar to that for managed stands was used to develop empirical yield curves for unmanaged stands. A curve was fitted to the net merchantable cubic volume of stands sampled in the 1974 Inventory for wild stands that had not been cut over and had a stand sampling error percent of 50 percent or less. This was done for each species working group and productivity class. The stands used in developing each curve along with analysis data are on file in the same notebook with the managed regenerated stand data.

The assumption underlying the use of these curves is that average performance of measured wild stands on the Flathead will approximate the performance of future stands on similar sites receiving no cultural treatments.

3. RECREATION

The concept on which recreation use is based is the ROS (Recreation Opportunity Spectrum) that has been adopted as the basis for recreation planning in the Forest Service.

a. Base Output Coefficient Development

The Regional Office memorandum of February 1, 1980 provided guidelines for developing recreation capacity in RVD (Recreation Visitor Days) per acre per year for each ROS opportunity class.

The base range of RVD/acre/year capacities for the ROS classes put forth in Regional guidance were not considered to be valid for Flathead National Forest in all cases. Therefore, coefficients more relevant to the Flathead were developed. The rationale for output coefficients is described below by ROS class.

On March 2, 1981, the Recreation Staff Officer, Forest Social Scientist, and recreation personnel from each District met to determine current recreation use by ROS class.

b. Rationale of Flathead Coefficients

(1) Wilderness Output Coefficient -

Low Prescription (RSL - Reduced-Service Level) based on 1979 wilderness use (1979 RIM Report).

High Prescription (FSL - Full-Service Level)

(2) P (Primitive) Output Coefficient -

Through RIM/ROS crosswalk determined current use was .24 RVD/acre/year. Due to present low management emphasis, this is assumed to be equal to low prescription output. Jewel Basin is the only managed primitive area outside wilderness and is receiving what is considered to be maximum acceptable level of use. This maximum level is .46 RVD/acre/year and is assumed to be representative of the high intensity prescription.

(3) SPNM (Semiprimitive Nonmotorized) -

Due to very limited management capability presently available, current SPNM use is judged to be well below a reasonable output level. Based on a review of Kootenai and Idaho Panhandle National Forests output coefficients and a comparison of current Flathead use, the proposed regional SPNM ranges were determined to be extremely high. A review of the rationale of Kootenai National Forest output coefficients for SPNM resulted in the conclusion based on professional judgment that the Kootenai's coefficients are applicable to the Flathead. This conclusion takes into account the proximity of the Kootenai and similarity of the resource base and users.

(4) SPM (Semiprimitive Motorized) -

Same rationale as SPNM. Because of space limitations in the Forplan Model P, SPNM and SPM output coefficients were converted to one weighted average output coefficient by low, medium, and high management intensities.

(5) RNA (Roaded Natural-Appearing) ROS Class -

The Kootenai RNA coefficient of 2.25 RVD/acre/year is deemed more appropriate than current use on the Flathead of .55 RVD/acre/year. 2.25 RVD/acre/year compared to current use is considered to be high intensity use. Thus again extrapolating to medium and low.

(6) Developed Recreation -

Average PAOT/Acre	3.0	
Average Season of Use	x 120	days
Season PAOT/Acre	360	
Reasonable RVD Capacity	x 1.5	
(1.5 RVD = Avg. RVD/site/24/hr. pd.)	540	
Use Factor for well managed and developed sites	.40	
(Provided by RO)	216 RVD/ Acre/Year	
*Flathead Use Factor = .20		
Coefficient	216 RVD/ Acre/Year	

*Based on RIM

Note: PAOT is People At One Time. Essentially it is instant capacity of developed recreation areas; i.e. campgrounds, picnic areas, boat launch sites, etc.

Table B-13 summarizes the coefficients that result from applying this rationale.

TABLE B-13 Recreation Capacity Coefficients - Flathead National Forest

Management Emphasis	Base RVD Capacity Coefficient/Acre/Year*		
Wilderness	Reduced-Service Level .13	Full-Service Level .299	
Roadless Dispersed (P, SPNM, SPM) Prescription	Low .5988	Medium .8786	High 1.195
Roaded Dispersed (RNA) Prescription	Low 1.12	Medium 1.69	High 2.25
Developed Prescription	Low 216	Medium 216	High 216

* Because of variation in various factors inherent in a given acre of land, every acre will not necessarily produce the same output. Therefore, adjustment factors were developed to compensate for area variations.

4. BIG-GAME WINTER FORAGE

Management direction for the scheduling of winter forage production outputs was developed by Jim Cross, Management Biologist, Montana Department of Fish, Wildlife, and Parks, and Bob Hensler, Wildlife Biologist, Flathead National Forest. Forage production estimates, around which curves were developed, are derived from research results and their knowledge of the ability of Flathead National Forest habitat type groups to produce usable forage for deer and elk.

Preliminary to the forage production estimate is the identification of the outer boundaries of the deer and elk winter habitat. It is recognized that winter habitat varies greatly with the severity of winter weather. Thus, an average condition was selected. Cross and Hensler delineated winter habitat on USGS 7-1/2 minute quad maps based on their combined observations of deer and elk under various winter conditions. If more than half of a capability area was mapped as deer or elk winter habitat it was coded as winter habitat in the model.

Inherent to the production of forage for deer and elk is their requirement for thermal cover.

Whitetailed Deer	-	Minimum of 50 percent of winter habitat in thermal cover at all times.
Mule Deer/Elk	-	Minimum of 30 percent of winter habitat in thermal cover at all times.

These minimum requirements must be met on all analysis areas for efficient use of forage by deer and elk.

Forage production curves were initially developed for six of eight habitat type groups (seven and eight are not considered winter habitat). Later the six production curves were reduced to two (Low-High) to save space in the LP modeling process by combining the six habitat type groups into two productivity levels. Forage production curves were then expressed as forage coefficients which show the consequences of management activities. The amount of forage produced is a function of the type of timber harvest and the type of habitat improvement practiced.

5. RANGE FORAGE

Production curves by habitat type group were developed by Williamson, 12/80, from forage clippings on existing range allotments. Forage production figures for Group I were prepared from similar habitat types described in Mueggler and Stewart's "Grassland and Shrubland Habitat Types of Western Montana" INT-66 and from clipping data from Tally Lake Ranger District.

The following tabulation displays range forage coefficients entered into FORPLAN.

Weighted Average lbs/acre Palatable Available Forage Low Prod. Groups 1, 2, 3, and 4

	Clearcut
Period #1	0 /acre/year
Period #2	59 /acre/year
Period #3	78 /acre/year
Period #4	47 /acre/year
Period #5	30 /acre/year
Period #6	25 /acre/year
Period #7	22 /acre/year
Period #8	20 /acre/year

	Shelterwood
Period #1	28 /acre/year
Period #2	68 /acre/year
Period #3	86 /acre/year
Period #4	42 /acre/year
Period #5	31 /acre/year
Period #6	25 /acre/year
Period #7	22 /acre/year
Period #8	20 /acre/year

On 18 Base line forage weight average this group is 18 lbs/acre

Weighted Average lbs/acre Palatable Available Forage High Prod. Groups 5, 6, and 7

	Clearcut
Period #1	0 lbs/acre/yr/period
Period #2	44 lbs/acre/yr/period
Period #3	37 lbs/acre/yr/period
Period #4	4 lbs/acre/yr/period
Period #5+	0 lbs/acre/yr/period

	Shelterwood
Period #1	17 lbs/acre/yr/period
Period #2	54 lbs/acre/yr/period
Period #3	63 lbs/acre/yr/period
Period #4	13 lbs/acre/yr/period
Period #5+	0 lbs/acre/yr/peirod

6. ROADS

Road mileages estimated in FORPLAN are based on densities required by alternative logging systems and existing road density of various analysis areas. The following road densities were assumed to fully develop an area for specified logging systems:

System	Density Mi/Mi^2
Aerial	0
Tractor	5.76
Ground Lead Jammer	9.6
Skyline 1000' EYD	5.7
Skyline 2000' EYD	3.2

7. SEDIMENT

Sediment coefficients estimating tons of sediment/acre produced in streams were developed for combinations of landtypes and prescriptions. The coefficients were developed using the Universal Soil Loss Equation and considered natural erosion, plus soil movement from soil exposed by management activities. Details are available in the planning records. These coefficients were not used as constraints or in any other way to formulate alternatives. They were designed to serve as relative index values to compare alternatives only, because they consist of unverified data with unknown statistical accuracy.

8. VISUAL QUALITY OBJECTIVES

Each management prescription has an assigned visual quality objective. A value of one is assigned as a nonscheduled output to the VQO appropriate to each prescription in FORPLAN. The sum of the acres assigned to the various VQO's are totaled for each FORPLAN solution.

9. GRIZZLY BEARS

To assess the effect of alternatives on the capability of the Forest to produce bears, an index of the relative impacts of prescriptions was developed by Jim Cross, Wildlife Biologist, Montana Department of Fish, Wildlife, and Parks, and Bob Hensler, Wildlife Biologist, Flathead National Forest.

The Forest was divided into five productivity areas by their relative capability to produce grizzly bears. Based on the professional judgment of Cross and Hensler, a density value (expressed in square miles per bear) population density was assigned to each area for development of output coefficients in the analysis of alternatives. Density values are not intended to reflect actual bear populations. They serve primarily for comparison to determine the relative capability between productivity areas. Estimates are reasonable based on sample populatons estimates from on-going research by the Border Grizzly Project*.

Following identification of the productivity areas, the influence of Forest Plan prescriptions on the population density estimates was assessed. Prescriptions were reviewed carefully for direction that would affect bears either positively or negatively, either directly through habitat change or indirectly by causing change in human/bear interaction. They are referred to as biological and human effects, respectively, and are grouped as follows:

BIOLOGICAL EFFECTS

1. Regulation or nonregulation of timber harvest.
2. Fire and fuels management level.
3. Silvicultural - diversity objective.

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* Jonkel, C.J., 1981 Border Grizzly Project Annual Reports, 1975-1981.

HUMAN EFFECTS

1. Regulation or nonregulation of timber harvest*.
2. Level of human activity not related to timber harvest (woodgathering, huckleberry picking, driving for pleasure, etc.)
3. Roaded or nonroaded objective.
4. Level of road and/or trail management.

Activities that cause biological or human effects from direction in the management prescriptions were then rated from +2, highly positive, to -2, highly negative.

Activities that cause human effects were assigned values twice that of biological effects**.

Each management prescription has one or more activities. Total ± values range from 11 (high intensity grizzly prescription to -10 (low intensity timber with roads prescriptions).

The weighted average density for each Ranger District and Special Area was then determined by multiplying the assigned density for each productivity area by the percent of the area on the District or Special Area.

Table B-14 shows the density in GB/Acre (x 10^{-5}) as determined by applying each of the activities in the management prescriptions to the weighted average density figures for each Ranger District and Special Area. These are the nonscheduled output coefficients to determine the effects of alternatives in the Forest Plan.

TABLE B-14 Grizzly Bear Density - GB/Acre (x 10^{-5}) - Flathead National Forest

	TLRD	GVRD	HHRD/ SBRD	SLRD	Special Areas
+60%	1.6	14.4	14.4	8.0	14.4
+40%	1.4	12.6	12.6	7.0	12.6
+20%	1.2	10.8	10.8	6.0	10.8
0%	1.0	9.0	9.0	5.0	9.0
-20%	0.8	7.2	7.2	4.0	7.2
-60%	0.4	3.6	3.6	2.0	3.6

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* Whether the prescriptions have direction for regulation of timber harvest has specific effects on bear habitat and the level of human activity, and therefore is considered under both biological and human effects.

** Based on Cross and Henslers' judgment, activities that cause human disturbance have twice the impact of activities that cause biological change in habitats.

G. ANALYSES DONE OUTSIDE FORPLAN

1. OLD-GROWTH HABITAT DISTRIBUTION

Alternatives were evaluated and compared for their long-term ability to provide habitat for old-growth dependent species by computing index values based on land use assignments for each alternative. In addition to the index, the geographic distribution was checked on maps and the amount of potential available below 5000' elevation was determined on maps. Detailed process criteria are available in the planning records (219.5(g)).

2. SEDIMENT AND WATER YIELD

a. Sediment Yield

Impacts of sediment from proposed management activity (road construction and timber harvesting) were estimated and analyzed outside FORPLAN. Coefficients used in the estimations were based on field observations, research, and data from Nation-wide sources with emphasis on the northern Rockies and the Flathead National Forest area. Major sources of information are listed in "Development of Sediment Coefficients for the Forest Plan" available in the planning records. The coefficients reflect surface erosional processes that operate in the Flathead National Forest area.

Sediment yields were estimated from FORPLAN output of acres of timber harvest by silvicultural treatment and landclass groupings and generalized miles of roads, both by decade. For each alternative, sediment yields for baseline conditions, existing situation, new road construction and maintenance, and proposed timber harvest were summed by decade for the first five decades.

b. Water Yield

Impacts from timber harvesting and road construction on water yield in 120 watersheds on the Forest were estimated using the ECA (Equivalent Clearcut Area) concept (USDA, 1975). This concept was developed from field observations, research, and data from the northern Rockies on streamflow responses to Forest management activities. The analysis produced water yield trends, relative differences between alternative actions, and approximate outputs for water yield for the first five decades.

Computation of water yield was made using acres of timber harvested by drainage, harvest method, year of harvest, along with miles of road built and year of construction. This figure was compared with natural water yield and existing water yield.

Impact of sediment production on water quality was not a direct issue or concern for the Forest Plan. It was analyzed as part of overall land stewardship.

3. FISHERIES COMPARISONS

Estimates of population size of coldwater fish in Flathead National Forest streams were based on the following components:

- Lake and stream fisheries habitat data base (compiled by Forest Service and Montana Department of Fish, Wildlife, and Parks).
- Lake and stream fish population surveys (actual counts - Montana Department of Fish, Wildlife, and Parks).
- Population modeling (Montana Department of Fish, Wildlife, and Parks).

Fisheries surveys included actual counts in over 375 representative stream reaches which provides the basic data for the current situation. Fish number estimates were developed from modeling of habitat parameters based on this data. Average numbers of catchable trout (6"+) per mile of stream were established. Lake and reservoir fish population numbers are based on actual observations conducted by Montana Department of Fish, Wildlife, and Parks over the past 25 years. Total coldwater fish numbers are the sum of stream, lake, and reservoir population estimates. The Flathead National Forest streams typically have pure, high quality water with low inherent productivity. The production of high numbers of fish from natural reproduction in these streams is not anticipated. This situation also prevails in Hungry Horse Reservoir because tributary streams to this body of water are the areas of natural reproduction and natural restocking. Generally, most high mountain lake fish populations must be maintained by stocking. Some lakes have tributary streams suitable for natural reproduction, but this is not the general rule.

Variables considered in arriving at fish population estimates for the various alternatives include: management emphasis and intensity in riparian areas; projected levels of habitat improvement; estimates of potential increases in livestock grazing AUM's; and water quality/sediment effects resulting from programed timber harvest. Management activities were analyzed relative to their proximity to the Forest's fishery streams.

The Forest aquatic environments were subdivided to aid in the fisheries analysis of the alternatives.

a. Streams - Wilderness Watersheds

These watersheds are not affected by timber harvest. Fish populations will remain relatively constant.

b. Streams - Managed Watersheds

These will be the fisheries most affected by the management alternatives. Fish populations will fluctuate with various levels and intensities of management.

c. Lakes

(1) Generally fish populations in lakes will not be affected by management alternatives. Fish population numbers will remain constant.

(2) Where lake fish populations, however, depend on adfluvial production, management alternatives will affect total fish populations levels.

(3) In Hungry Horse Reservoir, the trout population is dependent on tributary streams for natural reproduction. Cutthroat trout are entirely dependent on managed tributaries. Bull trout utilize managed tributaries downstream from the Meadow Creek Gorge to generate approximately 25 percent of their population in the reservoir. The remaining 75 percent of the population results from spawning in wilderness tributaries. Meadow Creek Gorge presents an effective natural barrier to spring spawners (cutthroat) but is passable by fall spawners (bull trout) because they spawn during the low water time of year and are larger in size.

Fish population estimates were developed for each alternative using these major components which included: watershed effect; riparian designation; and the effect of livestock use.

Water quality and sediment have the greatest effect causing changes in fish habitat and fish numbers. Selected watersheds on all five Ranger Districts were examined by the Forest Hyrdrologist. Programed acres exceeding watershed capacity/capability to withstand erosion and sedimentation were calculated. These data were related to fish habitat losses and corresponding reduction in fish numbers.

A watershed factor expressed as a percentage was developed for various levels of timber harvest. An 86 MMBF harvest level had a watershed factor of 2 percent. Increasing the harvest level to 102 MMBF yielded a watershed factor of 5 percent which corresponds to a calculated reduction in fish numbers of 23,650 catchable sized trout. On the basis of this example, a 1 percent change in the watershed factor is equal to a reduction of 4,730 catchable sized trout. This relationship is displayed in the chart and graph for Figure 21C in the planning files.

A factor was employed to provide for watersheds that were recovering from earlier harvests. This recovery factor was 1.5 percent per year and equated to 7,095 catchable trout.

Maximum fish habitat improvement and managing riparian zones to emphasize fish habitat can provide approximately 30,300 fish per decade. This can only be accomplished under full riparian designation.

Some of the alternatives that were considered did not designate full riparian management. Therefore, the fisheries targets/outputs were reduced in proportion to the reduced designation. Each alternative was evaluated on this basis.

A relationship was developed between the number of riparian acres designated and the resulting effect on the fish population. This relationship is displayed in the chart and graph of Figure 21A which is part of the planning files at Flathead National Forest.

Fisheries managers have long been aware of potential adverse effects by livestock grazing on the stream environment. Numerous studies and documentation have described the influences of livestock grazing on fisheries.

On the Flathead National Forest outside of wilderness areas, livestock grazing allotments are located primarily on the Swan Lake and Tally Lake Ranger Districts. One small allotment (15 AUM's) is located on the Glacier View Ranger District.

Livestock allotment information from these Districts was utilized to predict effects on fish population. A 25 percent increase in AUM's would result in a 25 percent reduction in fish habitat on streams in these areas. This relationship was developed for changes in AUM's and is displayed in the chart and graph for Figure 21B in the planning files.

4. ROAD CONSTRUCTION TIMING AND FINANCING

Data Adjustment - District personnel identified site-specific acres on the U2D alternative designation maps for the first decade and additional mileages were identified over those scheduled for the first decade by FORPLAN. This was necessary since FORPLAN just recognizes the miles needed for the acres scheduled. When these acres become site specific, they have to be connected to the existing system and to each other. This was accomplished by overlaying the acre designations on respective District transportation maps and stepping off additional miles with dividers. A ratio of additional miles to FORPLAN miles was developed and then used in each alternative to adjust FORPLAN miles to total needed miles. This resulted in shifting miles which FORPLAN scheduled over nine decades to five or six decades. The change in discounted costs for the road construction schedule shift was calculated and PNV adjustments made to benchmarks and alternatives outside FORPLAN.

An indepth analysis of alternative B4C FORPLAN outputs indicated an overscheduling of total road miles. This was traced to prescribing SLC (short-line cable) systems on extensive acres. FORPLAN sees the acres designated for SLC systems as one contiguous area and schedules roads accordingly. In reality, these acres are smaller scattered areas; roads planned to service other systems usually are located to pick up the SLC ground thus minimizing miles. FORPLAN information showed sufficient acres utilizing SLC to account for 600-700 miles of road per alternative. The total miles of road scheduled by FORPLAN were, therefore, reduced by 600 miles for all alternatives.

Costs relative to these 600 miles were left in FORPLAN to reflect those miles of road to be reconstructed under timber purchaser credits. These 600 miles were later proportioned out at 120 miles per decade for the first five decades. Construction costs in FORPLAN for these roads average about $36,000 per mile, compared to about $10,000 per mile for reconstruction in current timber sale purchaser credits. The 120 miles per decade, therefore, relate to approximately 430 miles of reconstruction per decade. This is reflected in the 10-year timber sale offering (Appendix M) of the Forest Plan.

5. ENERGY

Energy consumption was computed outside of FORPLAN. The energy consumption for each alternative is based on the estimated energy use required for Forest Service administrative activities, road construction, road maintenance, timber harvest, recreation use, and grazing permittees. Energy consumption is based on the gallons of gasoline and diesel fuel used in each of the activities. The energy coefficients used are shown in Table B-15.

TABLE B-15 Energy Coefficients (Specified Units)
Flathead National Forest

Activitiy	Coefficient
Developed Recreation	$.015 \times 10^7$ BTU/RVD
Dispersed Recreation	$.010 \times 10^7$ BTU/RVD
Road Maintenance	$.16 \times 10^7$ BTU/Mile
Administrative Sites	928.3×10^7 BTU's annually
Administrative Travel	$1407. \times 10^7$ BTU's annually
Timber Harvest	$.13 \times 10^7$ BTU/MBF
Road Construction	26.3×10^7 BTU/Mile
Range	$.0076 \times 10^7$ BTU/AUM

6. MINERALS

The minerals information required as part of the Forest Plan, per 36 CFR 219.12(j), came primarily from the following sources:

a. Information on active mining claims on the Forest, which is kept current by the BLM (USDI Bureau of Land Management). The "Recordation" information is collected under authority of Section 314 of the Federal Land Policy and Management Act. Mining claim locations and proof of annual assessment work is submitted to the BLM by the claimants. The BLM records the information and provides a synopsis to the Forest. The Forest maintains the "Recordation" information supplied by the BLM actively uses and relies upon it in the administration of various Forest and mining projects, and keeps it available to the public.

b. Forest and Regional Office Land Status records were reviewed to determine land status for outstanding and reserved mineral rights. Forest planning records were used to establish the locations and acreages for lands that are currently, or proposed to be, withdrawn from mineral entry (i.e., wilderness, W&SR, NRA, administrative).

c. Mineral occurrence and potential evaluations were based on evaluation of published and unpublished records, evidence of activity both past and present, and sampling data in some cases. Determination of Low, Moderate, High, and Very High potential ratings is based on guidance and direction received from the Minerals and Geology group of the Regional Office, and was so noted to provide rating continuity across Region 1.

7. INSECT AND DISEASE RISK

An index value for insect and disease risk was computed based on the land use assignments for each alternative. The index was based on land use objectives for roaded access, resultation of timber stands, degree of timber stand stocking control, and silvicultural systems employed as they affect the environment for insects and diseases. Additional details are available in the planning records (219.5(g)).

CHAPTER IV. COST-EFFICIENCY AND NET PUBLIC BENEFIT

This section describes cost-efficiency criteria and explains how net public benefits are derived. This analysis is required by National Forest Management Act regulations (36 CFR 219) and plays an important part in the development, comparison, and selection of Forest planning alternatives.

A. NET PUBLIC BENEFIT

Maximization of net public benefit is a goal of the Forest planning process. Net Public Benefit is the overall value to the nation of all outputs and positive effects (benefits) less all the associated Forest inputs and negative effects (costs) of producing priced and nonpriced outputs from National Forest System lands (36 CRF 219.3). Thus, net public benefit represents the sum of PNV (priced outputs) plus the net subjective value of nonpriced outputs. Net public benefit cannot be expressed as a numeric quantity because PNV cannot be added to qualitatively valued nonpriced outputs.

The following diagram displays the factors included in net public benefit:

1 **PNV (PRESENT NET VALUE)** 1
1 Priced Outputs 1 = Total PNV
1 Nonmarket + Market 1 ($)
1(e.g. Recreation) (e.g. Timber) 1

1 **NSV (NET SUBJECTIVE VALUE)** 1
1 Nonpriced Outputs 1
1 1 = Total NSV
1 Nonquantitative + Quantitative 1 (Non $)
1(e.g. Recreation Quality) (e.g. Roadless Acres)1

1 TOTAL **PNV** 1
1 + 1
1 Total **NSV** 1
1 = 1
1 **NET PUBLIC BENEFIT** 1

B. PNV (PRESENT NET VALUE)

PNV represents the dollar difference between the discounted value of all priced outputs and all Forest costs over the 150-year planning period. Two discount rates, --4 percent and 7-1/8 percent--, were used to represent the real cost of money over time (36 CRF 219.3). Priced outputs include those outputs with market values (timber, range, forage, mineral leases, developed recreation, and special-use permits) and those outputs with assigned nonmarket prices (dispersed recreation and wilderness recreation).

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Each benchmark and alternative was designed to achieve its goals and objectives in a manner that produces the greatest PNV. This was accomplished by solving FORPLAN with the objective function of maximizing PNV while meeting the specified constraint of the benchmark or alternative. The PNV calculated in FORPLAN is modified by including benefits and costs not modeled in FORPLAN. The modified values were used to evalute the benchmarks and alternatives. The benefits and costs not included in FORPLAN were those which do not influence and are not significantly influenced by land designation and output scheduling. This section describes how the prices and costs were calculated.

1. PRICE OUTPUT PARAMETERS USED IN PNV

a. Discount Rates

The discount rate represents an assumed social time preference. It is the rate at which society is assumed to discount future values as compared to present values. Two discount rates were used, 4 percent and 7-1/8 percent. The 4 percent rate approximates the return on long-range corporate investments, above the rate of inflation. (Row, et al, 1981). It was the rate used to evaluate benchmarks and alternatives. The 7-1/8 percent rate, which is consistent with the 1980 RPA, was used to determine sensitivity of the Preferred Alternative to the 4 percent rate by resolving the Preferred Alternative FORPLAN model and comparing results (see Chapter VIII - Section D for details on sensitivity tests). Also, the PNV of all benchmarks and alternatives was recalculated at 7-1/8 percent for comparison. All costs and benefits were discounted from the midpoint of the planning period.

b. Timber Demand Curve

No local demand curve for timber was used in the FORPLAN computer model. None of the available techniques for developing Forest-level demand functions has a strong enough theoretical basis that it can be suggested for use in Region 1. Available evidence also indicates that if a reliable Forest-level demand function could be calculated, the elasticity would be such that the use in FORPLAN would not be significant. As specified by the Washington Office (1920 letter to Regional Forester, "Downward Sloping Demand Curves," dated 2/3/81), the demand curve is assumed to be horizontal.

c. Real Price Increases

Two price trends were directly incorporated in the FORPLAN computer model for timber values: lumber price and private lumber production costs. These trends reflect the assumption that future demand increases or supply restrictions will increase national product prices. Stumpage values used in the FORPLAN model were the residual of these projected lumber prices and private production costs, and result from the application of both price trends.

Timber price and cost trends are summarized in Chapter VIII, Section D, consistent with the requirements of FSM 1971.4 (R-1 ID No. 5). Cost and price trends displayed are expressed in terms of proportional annual shifts per decade for six decades. The accumulated trend through the sixth decade was used for the seventh decade and beyond. The annual shifts were used to calculate the price and cost multipliers for the midpoint of each decade.

Price trends for valuing range forage and recreation (fishing, hunting, wilderness, roadless, roaded natural dispersed, and developed) were incorporated into the model by using appended rows and columns to the LP (linear program) matrix. The price trends were consistent with 1980 RPA assessments of the demand for these resources (FSM 1971.4, R-1, ID No. 6). The price trends for these resources are expressed as proportionate annual shifts in value for the first five planning periods. The accumulated trend in the fifth period is used for the sixth period and beyond. Sensitivity tests on the effect of using no price trends and using 1985 RPA assumptions were conducted and results are discussed in the EIS, Chapter II; and in Appendix B, Chapter VIII - Section D.

No real cost increases were used to determine anticipated agency costs beyond the base year. The average unit costs, however, of many activities will increase through time as more expensive management activities are scheduled. These costs are used in the model. For example, the unit costs of site preparation will increase as steeper and more expensive land classes are harvested.

d. Real Dollar Adjustments

Inflation was not included in the discount rates, benefits, and costs due to the difficulty of estimating future inflation rates and because inflation would equally affect both costs and prices. All prices and costs are expressed in first quarter 1978 dollars, consistent with the 1980 RPA. The GNP (Gross National Product) implicit price deflator index is used to inflate or deflate price and cost data to this common base (FSM 1971.32b).

2. BENEFITS AND COSTS USED IN PNV

All agency costs were estimated for the 150-year planning period for all benchmarks and alternatives. This section discusses how costs were developed, the major expenditure categories, funding source, and the actual costs by resource.

a. Cost Development Process

Agency costs were estimated for the 150-year planning period for all benchmarks and alternatives. This section discusses how costs were developed and designated into the major expenditure categories. Costs were developed by Forest personnel in conjunction with developing standards and guidelines for management prescriptions. Agency cost estimates were determined for all management activities and classified according to FSH 1309.11, MIH (Management Information Handbook) codes. These individual MIH costs were further combined to define management practices for recreation, wilderness, wildlife, fish, range, timber, water, minerals, human and community development, lands, soils, facilities, and protection. Management practices were used to define the primary unit costs associated with both the FORPLAN and external analyses. Cost estimates were based on 1980 base year activity, and expressed in 1978 dollars. Some costs include expenditures necessary to produce both priced and nonpriced outputs. The costs are based on 1980 experienced costs, historical data and professional judgment, and approximate the minimum funds needed to achieve the standards and guidelines in the management prescriptions. Cost data were used in developing feasible and cost-efficient prescriptions, consistent with FSM 1970.2, "Economic and Social Analysis Objectives." The costs which are dependent on land assignment and timber harvest schedule were modeled in FORPLAN. These costs were entered in the economic tables in FORPLAN. By solving FORPLAN to maximize PNV, the cost-efficient level of agency expenditures for these costs was estimated for 150 years. Other or "fixed" costs which were not modeled in FORPLAN were developed by the planning team to meet the objectives of each benchmark and alternative. The actual cost data is discussed later in this section. More detailed information on data sources and FORPLAN modeling procedures is in the Forest planning records, (Coefficient Documentation, 219.5 (g), 6/81).

b. Cost Categories

Costs were divided into four broad expenditure categories.

Fixed Costs represent the inescapable costs of managing the Forest in the absence of producing controllable outputs. These are costs associated with meeting minimum management requirements and legal standards, avoiding undue environmental damage, and providing for the safety of incidental users. Fixed costs represent the costs of activities which the Forest must maintain, regardless of any controlled outputs being produced. Fixed costs were assumed to be constant for all alternatives and were calculated outside FORPLAN. Fixed costs did not contribute to the FORPLAN objective function that maximized Present Net Value and do not affect land assignments. These costs, however, were added to the Forest costs, present value costs, and PNV outside the model. An average annual fixed cost of 1.900 million dollars was added to each alternative.

Variable or "Designation" Costs were calculated in FORPLAN and are the costs of Forest Service management practices that vary in amount and timing as well as in response to different land types and management objectives. These are the costs associated with assigning a particular set of management activities (prescription) to a given analysis area. Each management prescription has a unique set of variable costs. Variable costs directly influenced land assignments and scheduling of resource outputs. Variable costs for each alternative and benchmark are calculated per planning period and are contained in the FORPLAN Economic Reports contained in the Forest planning records. The costs reported include: road, site preparation, sale prep and silvicultural exam; timber stand improvement, reforestation, and nontimber resource management costs.

Overhead Costs represent the cost of activities which are required to produce, enhance, or mitigate more than one resource. For example, the cost of fire prevention and detection is classified as an overhead cost because this activity benefits all resources. These costs are included as per acre implementation costs, appropriate to support the multiple-use prescription. Overhead costs are included in the FORPLAN model objective function and contribute to land assignment and scheduling of resource outputs in FORPLAN.

Production Costs, also referred to as logging costs, are non-Forest Service logging and manufacturing costs. Production costs were developed using the Flathead National Forest stumpage valuation equations. These costs were used in the cost-efficiency analysis conducted by the FORPLAN computer model for stumpage price calculations but were excluded from budget calculations because they are purchaser, not Forest Service, costs. Briefly, production costs were calculated as the residual value between lumber selling price (log scale) and stumpage value. That is PC ($/MBF) = LP - SV. Production costs vary, depending upon timber yield, species composition, logging method, harvest type, harvest unit size, and d.b.h. class. These costs are labeled "Logging Cost" in FORPLAN Economic Report 7.

Adjustments were made to the local road construction miles needed per decade, necessitating adjustments to road construction and construction engineering costs. The FORPLAN model schedules road construction miles directly proportional to acres of timber harvested. This results in an underestimate of the miles of road needed in the early decades of the planning horizon because roads are needed to connect the new harvest areas to the existing road system. The total miles of road needed to complete the transportation system for a given alternative remained as calculated by FORPLAN; however, external to the model, some road miles were shifted from later to earlier decades. Associated variable costs were also brought forward, and PNV adjustments calculated outside the FORPLAN model.

c. Cost Data by Resource Component

Costs were associated with each resource output component for timber, roads, range, recreation/wildlife, and other joint costs. The joint costs are not separated into resource; e.g., fire protection and general administration. Costs are reported as annual averages for each alternative and benchmark and 15 planning periods.

It is important to note that some of the costs include expenditures required to produce, enhance, or mitigate more than one resource. For example, slash disposal costs may contain a cost to mitigate visual quality. This cost is currently unseparable and appears in the timber category. This illustrates that the costs by resource output do not always have a direct relationship with the benefits by resource. In general, calculating a PNV by individual resource may be misleading.

(1) Timber

Most costs of timber management were considered variable and were calculated in the FORPLAN model. These include the costs of:

- Stand examination
- Site preparation and slash disposal
- Reforestation
- Timber stand improvements
- Sale preparation and administration

Timber costs were entered into the FORPLAN model by the use of the economic yield tables which assign costs to specific management prescriptions and analysis areas.

Total timber variable costs are calculated by adding the site preparation, cultural treatment, and sale preparation cost items in FORPLAN Economic Report 7.

In addition to these activities, the fixed costs for timber planning and inventory were added to the total timber costs.

These costs were calculated outside the FORPLAN model and were assumed constant for all alternatives and benchmarks. These costs constitute only a minor portion of the total timber costs and account for $0.330 million dollars annually.

(2) Roads

The costs of preconstruction and construction engineering, road construction, purchaser road credits, and road maintenance were considered variable costs and were entered into the FORPLAN model as scheduled output costs. Roads to be constructed were scheduled as functions of alternative management prescriptions' logging systems and analysis areas with various existing road densities. The number of miles of new road needed is scheduled proportional to harvest acres as FORPLAN Scheduled Output 2 with an associated cost per mile for engineering transportation planning, location, survey, design, and construction administration. The actual construction cost per mile of new road is entered as Scheduled Output 7, Purchaser Road Credits. The cost of maintaining each mile of road construction scheduled was entered as Scheduled Output 8 FR & T dollars. Total variable costs for roads is calculated by summing the costs scheduled in FORPLAN Economic Report 5 for Scheduled Outputs 2, 7, and 8. Maintenance of the existing road system was entered as a per acre implementation cost assigned to all nonwilderness management prescriptions. Local road construction costs were further adjusted to account for an underestimation of road construction for timber harvests in the early decades.

(3) Other Resource and Support Programs

All other resource and support activities are considered variable costs and entered in FORPLAN as Scheduled Output 5 as per acre implementation costs associated with each management prescription. The implementation cost per acre per decade for each prescription is the sum of all the management activities called for by the prescription. Management activities are defined by the Management Information Handbook, FSH 1309.11. Total implementation costs are reported in FORPLAN Economic Report 5, Scheduled Output 5, Implementation Cost.

Implementation cost coefficients were calculated for Forest-wide resource or support activities by low, medium, and high alternative intensity levels. The alternative program cost was converted to a per acre implementation cost by dividing by the number of acres of the Forest suitable for the activity to be applied to. The coefficient was then assigned to the appropriate management prescription and intensity level. The implementation costs are arranged in the scheduled output tables so that FORPLAN may designate as a moderate or high intensity, but may not implement the higher intensity cost until a later decade if given the option in the prescription. The coefficients are coded in the tables with low intensity cost as a background value and the differences between low and moderate, and low and high to be added on the period of implementation. This option was to permit FORPLAN flexibility to allocate and schedule cost effectively, even for analysis areas not available or suitable for timber management such as wilderness and dispersed recreation areas where budget constraints or use may not require high intensity management in early decades.

Resource or support budgets and outputs can be disaggregated from Forest total implementation costs for alternatives and benchmarks by applying the proper coefficients to acres assigned to various management prescriptions.

(4) Budget Costs

Budget costs consist of the estimated appropriated costs of management for each alternative and benchmark. These costs were reported as annual averages for each of the 15 planning periods. Budget costs were stratified into the following categories:

- Fixed costs
- Planning and inventory costs
- Operation and maintenance costs
- Capital investments

A fifth category, purchaser road credit costs, was added to show the cost of constructing purchaser road credits for timber harvests. This cost was not included in the total budget costs, but was added to the total agency cost estimates used to calculate PNV. Delineation of what activity costs were included in each category followed the guidelines discussed in FSM 1971.32b (R-1, ID No. 6) and were adapted where applicable. Budget costs were calculated similarly to the method used to determine cost data by resource component. Variable or allocation costs for each budget cost category were summarized from the FORPLAN economic reports by planning period for each alternative and benchmark. Overhead costs for each budget cost category were then added to these summaries to determine the total categorical costs. Following is a summary of how each budget cost was determined:

(a) Fixed Costs

As defined, fixed costs represent the inescapable costs of managing the Forest in the absence of producing controllable outputs (see preceding discussion). Fixed costs were assumed to be constant for all benchmarks and alternatives at 1.900 million dollars annually, and were calculated outside the FORPLAN model. Following are the activities which contributed to fixed costs:

- Long range planning and inventory
- Water resource coordination with other agencies
- Fire, administration, and other maintenance
- Fire prevention and suppression
- General administration
- Human and community

(b) Planning and Inventory Costs

Planning and inventory costs are defined as the costs associated with long-term management planning and resource inventories (FSM 1971.32b, R-1, ID No. 7).

These costs were assumed to be constant for all alternatives and benchmarks, 0.505 to 0.770 million dollars annually. All planning and inventory costs were calculated outside the FORPLAN model, and include the following activities:

- Long range planning and inventory
- Timber planning and inventory
- Water resource planning and inventory
- Soils planning and inventory

(c) Operations and Maintenance Costs

Operations and maintenance costs include activities required to keep capital assets at agreed levels of service and availability, and activities required to produce, or incurred as, a result of producing controllable outputs (FSM 1971.32b, R-1 ID No. 7). Operations and maintenance costs were calculated as a summation of periodic costs reported in the FORPLAN Economic Report 5 - FR & T dollars, and the maintenance and operations activities portion of the per acre implementation costs (74 percent of Scheduled Output 8 costs) for each alternative and benchmark. Operations and maintenance costs included in the FORPLAN model were defined by FSM 1971.3 standards.

(d) Capital Investments

Capital investments are the costs associated with construction and reconstruction of roads, timber management investments, jointly used administrative, or other facilities with benefits occurring over more than one 5-year planning cycle (FSM 1971.32b, R-1, ID No. 7). Capital investment costs were calculated as a summation of periodic costs reported in the FORPLAN Economic Reports 5 - Output 2, Forest Service Engineering Cost, 8 percent of Output 5, Implementation Costs, Output 7, Purchaser Road Credits, Economic Report 7, Sale Preparation Cost, Site Preparation Cost, and Cultural Treatment Costs.

Following are the activities which constituted capital investments calculated in the FORPLAN model:

- Range forage improvements
- Range structural improvements
- Stand examinations
- Reforestation
- Site preparation - slash disposal
- Timber stand improvements
- Arterial and local preconstruction and construction engineering
- Arterial road construction
- Local road construction

(e) Purchaser Road Credit Costs

The purchaser-incurred costs of constructing and reconstructing local and minor collector roads required for timber harvest operations were included in the cost analysis to provide a true cost estimate of management activities. It is assumed that while these costs are purchaser-incurred, they do constitute government expenditures since timber revenues are paid to the purchaser for construction of these roads. They also constitute a portion of the costs used in assignment and scheduling within the FORPLAN linear program. Purchaser road credit costs, however, were reported separately because they do not constitute an appropriated fund required for implementation of any given alternative, but are necessary in order to produce timber outputs.

Purchaser road credit costs were derived from the FORPLAN cost estimates for local road construction for each alternative and benchmark (Purchaser Road Credit Costs - Economic Report 5). These costs were further adjusted for underestimations of road construction for timber harvest in the early decades, as previously discussed. It was assumed that 45 percent of the cost of local road construction for each alternative and benchmark would be funded with purchaser road credits in Decade 1, 75 percent in Decade 2, 83 percent in Decade 3, 73 percent in Decade 4, and 100 percent in Decade 5.

3. PRICED BENEFITS USED IN PNV

Resource outputs to which dollar values were assigned constitute the priced resource benefits included in the PNV calculations. Priced benefits were estimated for the 150-year planning period, and reported as annual average values for 15 periods for each alternative and benchmark. Priced benefits fell into two categories: market and nonmarket. Market benefits constitute the resources valued in terms of what people are willing to pay for them as witnessed by market transactions, or which could be traded under market conditions. These included benefits for timber, range forage, developed recreation, land use, power, and minerals (FSM 6531.12b, "Annual Collection Statement").

Nonmarket benefits are defined as goods and services valued in terms of what reasonable people would be willing to pay rather than go without the output. The value represents the marginal willingness-to-pay or the theoretical site rent that could be charged to users in addition to the cost of participation (i.e., equipment, food, lodging, etc.). Nonmarket benefits used in the analysis include dispersed recreation, wildlife, and fishing recreation opportunities.

The prices used in the analysis reflect onsite values for all resources; i.e., the value of the resource on the Forest. The values are consistent with cost estimates for activities which produce onsite resources. Benefits are classified as market values (timber, range, developed recreation, minerals) or nonmarket values (dispersed recreation). Furthermore, some of the benefits are actual receipts or in-kind payments to the government. The receipts serve as a base for 25 percent fund payments to local governments. Finally, some of the benefits are fixed. These benefits are associated with the Minimum Level Benchmark and are the benefits associated with no active management.

a. Prescription Assignment

As stated, both market and nonmarket benefits were used in the determination of total priced benefits; however, only certain resource benefits were used to determine the assignment and scheduling of prescriptions in FORPLAN. The reason these resource outputs were used is that their production could be linked to the analysis area/management prescription format. These include timber, dispersed recreation, wilderness, wildlife, and range.

b. Timber Benefits (Including Production Costs)

The total value of both existing and future timber inventories produced on the Forest was derived through the use of the FORPLAN model, and used to predict land assignments and scheduling of prescriptions. Timber values represent the average stumpage value of timber harvested on the Forest. Stumpage value is the difference between lumber's selling price and all production costs. Values reflect differences in timber size, species group, volume per acre, logging method, Northern Region utilization standards, and time of harvest for existing and regenerated timber stands. The values were first computed in dollars per thousand board feet and then converted to dollars per thousand cubic feet using average conversion board foot-cubic foot values weighted by species mix.

(1) Production Costs

Production costs, also referred to as logging costs, are non-Forest Service logging and manufacturing costs. These costs are used in the economic efficiency analysis conducted by the FORPLAN computer model but are excluded from budget and PNV calculations because they are purchaser not Forest Service costs. Briefly, production costs are calculated as the residual value between lumber selling price (log scale) and stumpage value, so that:

PC = LP - SV

where PC = production cost ($MBF)
LP = lumber selling price, l.s. ($/MBF)
SV = stumpage value ($/MBF)

Production costs vary, depending upon timber yield, species composition, logging method, harvest type, harvest unit size, and d.b.h. class.

(2) Timber Values

Stumpage value was estimated for tractor and cable logged (ground lead and skyline) areas by using a regression model that was developed using 1974 to 1980 data from timber sales sold on the Flathead National Forest. The regression model resulting from the data and used to predict timber values of Timber Volume Tables in FORPLAN is:

$$Y = -237.85 + .317\ SPLS - 58.88\ PVGL - 77.55\ PVSK + 94.92\ LOG\ (d.b.h.) - 0.3852\ THD$$

Where:

Y = high bid value per thousand board feet
SPLS = lumber price, log scale
LPT = Lumber Price Trend
PVGL = percent of the volume ground-lead logged
PVSK = percent of the volume skyline logged
LOG(d.b.h.) = the log of average d.b.h.
THD = Total Haul Distance

A separate equation was developed for helicopter areas using Regional data from the period 1972 to 1979. This equation is:

$$Y = 255.16 + 0.5511\ SPLS + 47.41\ LOG\ (d.b.h.)$$

These models were used to predict the value of timber stands represented by FORPLAN Timber Yield Tables on various landtypes and logged with alternative logging methods. FORPLAN economic tables were generated with timber values and costs for each Timber Yield Table logged by tractor ground lead cable, 1000' skyline cable, 2000' skyline cable, and aerial logging methods. This is to permit analysis of alternative logging systems and road density tradeoffs with economic data. Differentation of costs of production and sale preparation of commerical thinning was also considered. Lumber SPLS (Selling Price Log Scale) permits the economic variation between timber stands due to species composition to be considered.

In addition to the physical description of the timber stands provided by the Timber Yield Table data and the logging methods used, harvest unit size is the last major variable considered in the FORPLAN timber economic data. Although unit size is known to be a significant factor in logging, slash disposal, reforestation, and sale preparation costs, very little actual cost data was available. Data was available for sale preparation costs indicating 10-acre unit size cost about 5 percent more than average and very small units of 2-5 acres cost 10 percent more than average. It was assumed that 10-acre units cost 5 percent more for all phases of costs, from sale preparation through reforestation, and 2-acre units will cost 10 percent more than standard. FORPLAN Economic Tables were formulated for all combinations of timber yield tables, logging methods, and average unit sizes of 2 acres, 10 acres and 30 acres. The values were first computed in dollars/MBF and than converted to dollars/MCF using average BF/CF conversion ratios for each species.

Additional details on how timber values are calculated and entered into the FORPLAN model can be found in the planning records.

Total timber benefits for alternatives and benchmarks are calculated from FORPLAN Economic Report 6, column 3 "Timber Value" minus "Logging Costs" from Economic Report 7.

b. Range Benefits

The value assigned to range forage reflects potential dollar returns from the range resource to the taxpayers even though only part of the price is actually collected by the Forest. The price is the net value to the rancher above the cash costs for grazing on the Forest. The value on the Forest is $11.13/AUM (Gleason, USDA

Economic and Statistics Services, 1981). This price is expected to increase in real dollars in the next five decades as red meat consumption increases (1980 Resources Planning Act Assessment). Future values in dollars per AUM are:

1990	$11.58
2000	12.13
2010	12.69
2020	12.91
2030	13.13

Receipts from the grazing program are fees paid by the permittee. The receipt value on the Forest is $1.73/AUM which is an average value for 1977-1982.

The value of the range program associated with Minimum Level Benchmark is the value of the current program until allotments expire. The value in other benchmarks and alternatives is calculated by applying the appropriate prices to the livestock forage schedule in FORPLAN. Benefit values were modeled in FORPLAN by using appended rows and columns for all decades.

c. Recreation/Wildlife Benefits

The value assigned to recreation reflects potential dollar returns from recreation to the taxpayers even though most dollar values are not actually collected by the Forest. The value is the difference between the total value of a recreation experience to the recreation user and the cost of participating. The prices vary by type of experience and are expected to increase in the future. The values for the Forest are displayed in Table B-16.

TABLE B-16 Current and Future Prices for Recreation (1978 Dollars, $/recreation visitor day) - Flathead National Forest

	1990	2000	2010	2020	2030+
Big-game hunting	21.00	22.05	24.99	27.93	31.50
Wildlife viewing	29.00	30.45	34.51	83.57	43.50
Fishing	15.75	15.75	17.96	19.37	22.05
Wilderness	8.00	8.00	9.12	9.84	11.20
Other dispersed and developed recreation	3.00	3.15	3.37	3.99	4.50

Source: FSM 1970 R-1, 1981.

Recreation outputs in FORPLAN are not scheduled. There are three categories of recreation opportunity outputs (measured in MRVD's of capacity) calculated in the model - wilderness, dispersed roaded recreation, and dispersed roadless recreation.

Of these recreation outputs, certain proportions were called hunting and fishing related RVD's. The proportions of total Forest RVD's in 1980 that were hunting and fishing related are held constant over time. RIM data for the last 5 years indicates the proportions have remained relatively constant.

In addition, a proportion of RVD's in these three recreation output categories that are "Nature Study" are valued as nonconsumptive fish and wildlife related recreation.

The remainder of recreation outputs in the three categories are valued as recreation, dispersed, and wilderness. The proportions established using the FY 1980 RIM data are as follows:

Total Wilderness Recreation -
- 137.0 RVD's
- 30.8 RVD's - fishing (22.5%)
- 13.2 RVD's - hunting (9.6%)
- 93.0 RVD's - remainder (67.9%)

Total Roaded Recreation -
- 385.0 RVD's
- 44.6 RVD's - fishing (11.6%)
- 21.9 RVD's - hunting (5.7%)
- 318.5 RVD's - remainder (82.7%)

Total Roadless Recreation -
- 115.0 RVD's
- 13.3 RVD's - fishing (11.6$)
- 24.7 RVD's - hunting (21.5%)
- 77.0 RVD's - remainder (66.9%)

Wilderness RVD's are valued:

22.5% at $15.75 (fishing)

9.6% at $21.00 (hunting)

66.9% at $ 8.00 (wilderness)

1.0% at $29.00 (Nature Study)

The weighted average base value is $11.20

Roaded recreation RVD's are valued:

11.6%	at $15.75
5.7%	at $21.00
82.0%	at $ 3.00
.7%	at $29.00

The weighted average base value is $5.68

Roadless recreation RVD's are valued:

11.6%	at $15.75
21.5%	at $21.00
66.9%	at $ 3.00

The weighted average base value is $8.35

Projected use for these three categories of recreation are available through 2030, the fifth period of the FORPLAN planning horizon (Flathead National Forest: Recreation Consumption Forecast, Giannettino, 8/81). As total recreation activity on the Forest increases, hunting and fishing activity would increase. (See Table B-17 for projected use by time period.) In each period, RVD's of each type of recreation output are valued up to the projected level of consumption unless capacity (the FORPLAN outputs) is less than projected use. In such an instance, all the outputs would be valued because all that is available would be used.

Projections do not extend beyond 2030. The level of use expected for 2030 is assumed to remain constant for the next 100 years (10 periods) as would the value per RVD.

TABLE B-17 Recreation Values and Valuation Ceilings Used in FORPLAN - Flathead National Forest

		Values	Upper Bound (MRVD's/per 1 decade)
Period 1	Wilderness	$11.20	2048.0
	Roaded	$ 5.68	4374.0
	Roadless	$ 8.35	1307.0
Period 2	Wilderness	$11.20	3150.0
	Roaded	$ 5.96	5829.0
	Roadless	$ 8.77	1741.0
Period 3	Wilderness	$12.77	4510.0
	Roaded	$ 6.76	7621.0
	Roadless	$ 9.94	2277.0
Period 4	Wilderness	$13.78	6127.0
	Roaded	$ 7.55	9440.0
	Roadless	$11.11	2820.0
Period 5	Wilderness	$15.68	8077.0
	Roaded	$ 8.52	12325.0
	Roadless	$12.53	3680.0
Periods 6 - 15	Wilderness	$15.68	80770.0
	Roaded	$ 8.52	123250.0
	Roadless	$12.53	36800.0

d. Minerals Benefits

Receipts from the mineral program are fees paid for mineral leases and royalties. The value is $122,000/year in the first decade and $73,000/year in later decades. Receipts are calculated outside FORPLAN, are associated with minimum level, and assumed to be constant for all benchmarks and alternatives. They are not affected by land management activities, and they assume a moderate level of mineral activity.

e. Cash Receipts

FORPLAN includes dispersed recreational values which represent an estimate of visitor's "willingness to pay" if a fee was charged. Recreation fees are changed for developed recreation only. Actual cash receipts to the Treasury for recreation, minerals, land use, and power fees are shown in Table B-18. All these cash receipts are calculated outside of FORPLAN.

TABLE B-18 Anticipated Fee Collections - Developed Recreation, Minerals, and Other Fee Receipts. (Annual Average - Million Dollars) - Flathead National Forest

Output	Value ($MM - Annual Average)				
	1990	2000	2010	2020	2030+
Developed Rec.	.527	1.135	2.019	3.179	4.617
Minerals	6.720	6.720	6.720	6.720	6.720
Land Use Receipts, User Fees & Power	.236	.467	.368	1.182	.784

4. PNV (PRESENT NET VALUE CALCULATIONS)

As stated, PNV was calculated to determine the relative cost efficiency of each alternative and benchmark. PNV is the difference between the discounted values of all outputs to which monetary values or established market prices are assigned, and the total discounted costs of managing the planning area (36 CFR 219.3). PNV was calculated over the entire 150-year planning period for each alternative and benchmark.

In order to determine PNV, the PV (present value) of PVC (discounted costs) and PVB (discounted benefits) were calculated individually for each of the following resource components:

Costs	Benefits
Timber	Timber
Recreation	Recreation
Roads (including purchaser road credits)	
Range	Range
Recreation per Wildlife	Recreation per Wildlife
Other	Other

Benefits by resource component category were determined by stratifying the market and nonmarket benefits discussed in Section B in the following classifications: (1) Timber - timber revenues; (2) Recreation - developed, dispersed, and wilderness recreation values; (3) Range - range forage and range receipts; (4) Recreation per wildlife - wildlife recreation values, commercial values, and developed recreation receipts; (5) Other - land use, power, and mineral receipts.

The PV of each resource component was derived by multiplying the average annual periodic values by a factor of 10 to determine the total periodic value of each resource component. These total periodic values were then discounted from the mid-point of each planning period, and summed to determine total PV by resource component. The sum of all discounted resource component costs (PVC) was then subtracted from the sum of all discounted resource component benefits (PVB) to determine PNV at both the 4 percent and 7-1/8 percent discount rates. The benefit per cost (B per C) ratio for each alternative and benchmark was also calculated by determining the ratio of PNV per PVC (4 percent only).

In addition to the above categories, the PV of priced resource benefits was also categorized by market vs. nonmarket and Federal receipts vs. other benefit classifications to show their relative proportion of PVB. Benefits were classified in these categories in the following manner:

Market Benefits	vs.	Nonmarket Benefits
Timber returns		Wilderness recreation values
Range forage		Dispersed recreation values
Range receipts		Wildlife recreation values
Developed recreation values		
Developed recreation receipts		
Other benefits (land use, power, mineral receipts)		

Federal Government Receipt Benefits	vs.	Other Benefits
Timber returns		Wilderness recreation values
Range receipts		Dispersed recreation values
Developed recreation receipts		Developed recreation values
Other benefits (land use, power, mineral values)		Wildlife recreation values
		Range Forage

5. OPPORTUNITY COSTS

In order to determine the relative cost-efficiency of the various alternatives and benchmarks, opportunity costs were derived to show the difference in PNV between FORPLAN runs. Opportunity costs are defined as the value of a resource's foregone net benefit in its most economically efficient alternative use (FSM 1970.5). In relation to the economic analysis, it represents the difference in PNV between the Max PNV (MPO) benchmark, or alternative with the highest PNV, and subsequent FORPLAN runs. Opportunity costs measure the change in PNV value for priced resource outputs, and can be used to measure the relative value of nonpriced benefits included in net public benefits. (This topic is discussed further in Sections VI, VII, and VIII.)

C. NET SUBJECTIVE VALUE

1. DEFINITION

Net subjective value is the total qualitative value of all resources or outputs whose value cannot be measured in dollars. Market transaction evidence is not available for these outputs and therefore no basis exists for making market value estimates comparable with priced outputs. Nonpriced outputs are valued subjectively. In general, as the subjective value of nonpriced outputs increases, the monetary value of priced outputs as measured by PNV decreases. The magnitude of the monetary value foregone is measured and displayed as an opportunity cost or tradeoff. "Net" implies that both nonpriced benefits and costs can occur.

The most important nonpriced outputs in this analysis are the outputs identified by the six major issues: timber, visual quality, wildlife and fish, soil and water quality, roadless area designation, and wilderness designation. Different levels of nonpriced outputs are produced in different alternatives by applying management prescriptions to specific areas and/or by applying output and inventory constraints. Any dollar costs associated with nonpriced outputs are included in PNV calculations. How well an alternative resolves issues is a general measure of its net subjective value.

2. NONPRICED OUTPUTS

This section summarizes major nonpriced outputs, who is affected by changes in output levels, what indicators were used to measure output changes, and how the changes in the output levels affect present net value. Nonpriced outputs, as issues, are discussed in Appendix A.

a. Big-game Hunting Quality

PNV calculations include the number of hunting recreation visitor days as a simple proportion of total recreation opportunities but do not include the quality of the hunting experience. Decreases in PNV occur when land is managed as winter range to increase big-game population potentials.

Big-game hunting quality indicators include number and type of hunting permits granted, length of the hunting season, diversity of hunting experiences available, and opportunities for a successful hunt. According to the Proposed Montana Department of Fish, Wildlife, and Parks "Road Management Policy," the first two indicators are influenced by the relative security of big-game habitat. Two of the manageable factors influencing habitat security are road access and available hiding cover.

b. Dispersed Recreation Setting Qualtiy and Diversity

PNV accounts for the number of dispersed recreation opportunities but does not address quality and diversity. Providing a wide range of settings varying in the level of development and access ensures that the broadest segment of the public will find quality recreational experiences both now and in the future. Also, certain environmental settings have a high potential for providing quality recreational experiences. Certain landform types, vegetative types, scenery, water, and wildlife are factors that can contribute to the quality of the recreation setting. Areas where public comments have indicated interest in maintaining a primitive or semiprimitive recreation setting influenced net subjective value. Areas of interest include the north end of Glacier View Ranger District, the Swan Mountain Range, Glacier Slough, and the Spotted Bear River.

c. Threatened and Endangered Species Habitat

Maintaining or restoring viable populations of threatened and endangered species is included as a nonpriced output. Decreases in PNV and additional habitat improvement costs occur when timber harvest is constrained to achieve grizzly bear management objectives.

d. Water Quality

Water quality is considered a nonpriced output. The quality of Forest waters is a significant component of net public benefits. Forest streams, lakes, and rivers contribute directly to several community water supplies and to other domestic water systems that indirectly receive runoff from Forest land. In addition, outfitter camps, resorts, summer homes, and public recreation sites on National Forest System land utilize Forest water. Highly significant recreational and fisheries values are associated with Forest streams and Flathead Lake, located off the Forest but fed by National Forest watersheds. These values are not included in the alternatives' PNV but are examined in the discussion of net public benefits.

e. Visual Quality of the Forest Landscape

Visual management constrains timber management options, thereby contributing to increased costs and reduced PNV. Visual quality benefits do not contribute to PNV. Therefore, visual management objectives for each alternative are evaluated in terms of their contribution to net subjective value.

f. Nongame Species Wildlife Habitat

The nongame species habitat is considered a nonpriced output. PNV is reduced when areas are managed to protect nongame species and timber management options are reduced. Several laws require recognition of all wildlife species on National Forest System lands, including NFMA which requires maintenance "of viable populations of all existing native species."

g. Local Economic Stability

The value of maintaining or increasing local economic stability is not included in PNV. Maintenance of a sustained flow of Forest resources and uses to local communities decreases PNV because management options are decreased. Economic stability implies a dynamic, diverse, orderly, changing, and growing economy.

The degree to which the production of goods and services associated with each alternative is responsive to the evolving local economy is assessed in the calculation of net public benefits. The variety and volume of goods and services contribute to the nonpriced component of net public benefits through impacts on the zone of influence for potential employment and income.

h. Nonrecreation Wilderness Values

The value of maintaining more than a primitive recreation setting on the Forest is important. The qualities of natural integrity, natural appearance, and opportunities for solitude are important. Wilderness advocates have brought out several nonpriced benefits of these "naturally-functioning" systems; "clean air and water, unblemished landscapes," "free-roaming wildlife populations, spiritual fulfillment and a sense of freedom and dignity in an increasingly crowded and regimented world."* Other nonpriced benefits include the natural gene pool and scientific values attached to wilderness. Areas with well established primitive use patterns and those close to Kalispell are highly valued. Areas of particular interest, due to their high potential for providing qualities beyond the primitive recreation experience, include the Swan Range, the north end of Glacier View Ranger District, and the Spotted Bear River.

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* Drawn from Bill Cunningham's (Montana Wilderness Association Conservation Director) writeup, FUTURE TRENDS IN NATIONAL FOREST MANAGEMENT: A PERSPECTIVE FROM THE MWA, Dec. 1983.

CHAPTER V: SOCIAL AND ECONOMIC IMPACT ANALYSIS

A. OVERVIEW

Social and economic impact analysis estimates the relationship of Forest activities to people. Short-term impacts are of primary concern with consideration given to longer term effects (over 10 years) occurring within the impact area.

Forest-related economic impacts on employment, income, and state and local government revenues are directly related to the social well-being of people in the impact area. Additionally, the population's lifestyles, attitudes, beliefs, values, and social organization are linked to Forest management activities.

Prior to the development of alternatives, information was gathered on the existing social and economic situation of the impact area.

B. IMPACT ANALYSIS AREA

The Forest's impact area is Flathead, Lake, and Missoula Counties in Montana. This area receives most of the economic and social impacts related to the Forest's activities.

The zone of influence is that geographical area wherein people live and/or work who are most likely to be affected by the agency's land and resource management. Once identified, the local zone of influence lets the Forest planning team focus its public participation efforts, socio-economic analysis, and socio-economic assessment of management alternatives on those publics most directly impacted by Forest Service decisions and activities. Of all the publics affected by management decisions, local people - people who live in close proximity to the Forest - experience the effects of Forest programs most directly and in the greatest number of ways. In delineating a local zone of influence, the zone boundary must encompass those publics who depend upon the Forest's resource in multiple ways, and who don't have a variety of options open to them for access to Forest resources.

The zone will exclude those publics whose visits to Flathead National Forest are on a less regular basis and could be shifted to alternative areas. Economic benefits for those people outside the zone boundary will be assumed to be comparatively minor.

As a first step in determination of the Flathead National Forest zone of influence, areas of influence for specific resource outputs will be defined. A "nodal region" concept is used. A nodal region is an area delineated by measuring the flow of goods and services from a node or center to outlying areas.

The following resources are used: (1) Recreation, (2) Wilderness, (3) Wildlife and Fish, (4) Range, (5) Timber, (6) Human and Community Development, and (7) Land.

The specific resource areas of influence are "nested" in the process of describing the Flathead National Forest zone of influence. As previously mentioned, the objective is to delineate those publics who experience the effects of Forest programs most directly and in the greatest number of ways. Therefore, the zone boundary will be drawn so as to include those counties with several resource flows from the Forest.

Although the "nesting" process identifies those boundaries common to all resource areas, it also identifies boundaries that are not common. The zone, to the greatest extent possible, encompasses the geographical areas of all particular resource areas.

The Flathead National Forest planning team decided on the criteria for the number of distinct resource flows required for a county to be included in the Forest Zone of Influence. For the Flathead National Forest, any county with two or more resource elements represented is included within the zone of influence. The team believes this allows for adequate representation of the local publics.

The zone of influence for the Flathead National Forest includes Flathead, Lake, and Missoula Counties. Within these counties are believed to be 80-90 percent of the resource users of the Flathead National Forest. Further information on the delineation of the zone of influence is included in the planning records under "zone of influence".

C. ECONOMIC IMPACT MODEL

An input-output model (IMPLAN) was used to estimate the employment and income impacts of Forest outputs and activities. Direct, indirect, induced, and total impacts were calculated.

Economic input-output (I-O) analysis is a procedure for describing the structural interdependencies of a regional economy or impact area and serves as a short-term predictive model for evaluating the impacts of shifts in Forest outputs and activities.

I-O analysis is based upon the interdependence of production and consumption sectors in the impact area. Industries must purchase inputs from other industries, as well as primary sources like natural resources, for use in the production of outputs which are sold either to other industries or to final consumers.

Flows of industrial inputs can be traced via the I-O model to show linkage among the industries in the economy. The accounts are also transformed into a set of simultaneous equations that permit the prediction of economic effects resulting from changes in Forest outputs and activities.

I-O analysis is based on assumptions that limit the accuracy of projections. Therefore, the numbers presented are relative indicators rather than absolute projections.

1. IMPLAN DATA BASE

The I-0 model data base consists of (1) a national level technology matrix and (2) a county-by-county file of estimated activity levels for total gross output, six components of final demand, three components of final payments and employment for 466 industrial/business sectors.

The national technology matrix is based on a 1972 Commerce Department I-0 model converted to an industry by industry basis and updated to 1977 using the RAS procedure (Clopper and others, 1974). The county level information is based on a 1977 data set constructed by Engineering Economics Associates of Berkeley, California.

Using the national technology matrix and the regional control totals for the local impact area, a data reduction method was used to develop a regional input-output table. The method uses the property of "openness" displayed by regional economies compared with the national economy (Richardson, 1972). Smaller regional economies exhibit much greater tendencies or are more open to import and export than is observed at the national level. Based on the assumption that trade balances are the principal difference between national and regional purchase patterns, the supply-demand pool technique for data reduction was adopted (Schaffer and Chu, 1969).

2. FINAL DEMAND EXPENDITURES

The IMPLAN model translates Forest outputs and activities into employment and income impacts. An intermediate step is the translation of outputs into final demand dollars. Final demand expenditures are different from the values used in the efficiency analysis. Final demand expenditures represent the dollars spent by the final consumers of the finished products derived from Forest outputs. For instance, timber is processed into lumber which has a sale value at the mill. The sale value represents the amount of new money that will be directly generated for the local impact area--assuming that most is sold outside the impact area, this causes the local impact. The efficiency analysis examines only stumpage or the market value of the raw material that leaves the Forest.

This modeling step is accomplished by applying a final demand expenditure per unit of output to total outputs and linking the resulting dollar amount to the sectors in which the direct expenditure takes place. This process determines the change that takes place in the existing economy. Expenditure information is contained in the planning records.

D. BASE YEAR EMPLOYMENT AND INCOME INFORMATION

Forest outputs for 1980 were identified and analyzed with the I-0 model to provide a base situation from which employment and income changes could be measured. Table B-19 contains 1980 output levels, employment and income amounts associated with 1980 outputs, and the response coefficients per unit of output. Table B-20 shows employment and income for alternatives and benchmarks.

TABLE B-19 Forest Outputs and Impacts in 1980 - Flathead National Forest

Output	1980 Production	Employment			Income		
		Direct Jobs	Total Jobs	Jobs/Unit	Direct M$	Total M$	Unit M$
Softwood sawtimber	92.9 MMBF	439	1394	15.0/MMBF	6983	18023	$194/MMBF
Picknicking	14.9 MRVD	5	11	.7/MRVD	47	103	$ 7/MRVD
Camping	135.6 MRVD	13	25	.2/MRVD	111	238	$ 2/MRVD
Skiing	99.6 MRVD	204	389	3.9/MRVD	1422	3365	$ 34/MRVD
Water-based recreation	26.0 MRVD	9	22	.8/MRVD	87	222	$ 9/MRVD
Dispersed nonmotorized recreation	181.9 MRVD	103	205	1.1/MRVD	771	1840	$ 10/MRVD
Dispersed motorized recreation	354.2 MRVD	208	411	1.2/MRVD	1474	3604	$ 10/MRVD
Big-game hunting	60.0 MRVD	48	95	1.6/MRVD	439	933	$ 16/MRVD
Fishing	75.2 MRVD	19	36	.5/MRVD	145	331	$ 4/MRVD
Livestock	3.7 MAUM	1	4	1.0/MAUM	3	31	$ 8/MAUM
Forest operations maintenance and capital investment	10.71 MM$	144	318	29.7/MM$	2012	3898	$364/MM$
Forest salaries	5.51 MM$	112	228	41.4/MM$	1105	2343	$425/MM$
Total		1305	3138		14599	34931	

Total jobs for the three counties (Flathead, Lake, and Missoula) are estimated to be 38,008. Of this, 8.3 percent, or 3,138 jobs, is related to Forest Service activities on the Flathead National Forest. The employment generated 35 million dollars in personal income, or 7.6 percent of total income (461 MM$) in the area of influence.

TABLE B-20 Forest-Related Private Sector Employment and Income for Alternatives and Benchmarks - Change from 1980 Situation - Flathead National Forest

	Employment*			Income (MM$)**		
	Decade 1	Decade 2	Decade 5	Decade 1	Decade 2	Decade 5
Alternatives						
1	-68	188	2342	-1.51	1.40	23.17
2	498	955	3172	5.72	9.67	32.83
3	-60	673	2855	-.54	6.19	29.01
4	-707	94	2179	-9.54	-.36	22.50
5	-138	484	2457	-2.19	4.08	24.62
6	696	1624	3261	8.60	16.98	33.33
7 (CD)	435	845	2293	5.41	9.33	23.79
8	213	603	2919	2.28	5.57	30.21
8 Dep. A	217	511	2933	2.33	4.39	30.41
8 Dep. B	335	840	3039	3.82	8.60	31.75
9	73	542	2094	.73	4.78	21.64
10	-207	460	2175	-3.00	3.83	22.07
11	209	669	2796	2.24	6.42	28.65
12	205	638	2894	2.18	6.02	30.01
13	197	616	2826	2.11	5.76	29.34
14	196	623	2690	2.12	5.87	27.87
15	176	612	2582	1.87	5.74	26.63
16	-344	230	1801	-4.76	.91	17.53
17 (PA)	201	664	2710	2.14	6.37	27.55
MINLVL	-1932	-2304	-1450	-24.1	-27.3	-18.3
MAX PNV	89	615	3117	.8	5.8	32.8
MAX TIMBER	1564	1550	1957	20.0	19.1	23.7

* Base = 3,138 jobs.
** Base = 349 (MM$) - Employee Compensation (1978$).

E. RETURNS TO THE U.S. TREASURY AND LOCAL GOVERNMENT

Predicted returns to the U.S. Treasury and local governments for each alternative and benchmark were calculated in the analysis to show the effects on revenue programs administered by the Flathead National Forest. These returns illustrate the impact of management on both Federal Government receipts collected as a result of revenue producing programs on the Forest, and the resultant change in revenues passed on to local government. Comparisons were made between the average annual returns per period for each alternative and benchmark, and the base year (1980).

Returns to the U.S. Treasury were calculated by deriving the revenue of income producing programs on the Forest which correspond to FSM 6531.12b "Annual Collections Statement", or the National Forest Fund. Total Treasury returns were broken down into three categories: timber, grazing, and other (includes recreation, land use, power, and mineral fees). Timber returns were calculated for each FORPLAN run from the gross timber revenues (FORPLAN Economics Report 6) minus logging costs (FORPLAN Economics Report 7). Grazing returns were also calculated from the FORPLAN analysis and were equal to the average unit permit fee in 1980 ($2.40/AUM in 1978 dollars) times the average annual AUM output per period for each alternative and benchmark. Other returns were calculated as the sum of fees collected for recreation, land use, power, and minerals. Recreation fees were calculated by adjusting current collections by the percentage increase in use for developed recreation through the planning period. Returns for land use, power, and minerals were assumed to be constant at the current level (1980) over the entire planning period. Table B-21 summarizes the base year returns to the U.S. Treasury and local governments.

TABLE B-21 Base Year Estimates - Returns to the U.S. Treasury 1980 - Flathead National Forest

Resource	U.S. Treasury Returns (1978$)	Local Government Returns (1978$)
1. Timber	7474.8 M	1868.7 M
2. Range	6.1 M	1.5 M
3. Other	122.2 M	30.5 M
Total	4403.2 M	1990.7 M

Returns to local governments are Treasury funds paid to the State of Montana and eventually passed to local governments result from revenue-producing programs on the Forest. The basis of this fund, Returns to the U.S. Treasury, is discussed above. Also included in the base value are collections for KV (Knudsen-Vandenburg) and purchaser road credits. Calculations of returns to local governments are defined as:

(Returns to U.S. Treasury
Returns to Local = .25 X Plus KV collections and
Government purchaser road credits)

F. WORK FORCE

Shifts in Forest Service work force (measured as WYE = Work Year Equivalents) were calculated to show the change in government employment resulting from increases or decreases in land management programs for each alternative and benchmark. Adjustments were made to the base year level (470 WYE) according to the following assumptions:

- Average salary per WYE is $16,000 (1978$)
- About 50 percent of the budget is allocated for salary, therefore, WYE's can be calculated by dividing the total budget by $32,000.
- An adjustment factor was used to reflect the fact that at lower budget levels, a higher percentage of the budget would be in salaries; at higher budget levels, a lower percentage of the budget would be in salaries.

G. SOCIAL MEASURES

Social impact analysis is the estimation of how Forest Service policies and actions affect the quality of life or social well-being. The analysis is accomplished by projecting future social conditions in an area influenced by Forest Service actions if current management is unchanged, then comparing this projection with conditions likely to occur as a result of implementing management alternatives.

Social measures include two aspects of social impact analysis: social and social zones of influence. Social variables define how people are affected and the relationship between people and the physical and biological environment. The social zones of influence define who is affected by Forest Service activities.

1. SOCIAL VARIABLES

a. Lifestyles

Lifestyles are the characteristic ways different segments of a population live. People use Forest resources to maintain a way of living that is financially dependent upon a particular resource-related occupation. Logging, log homes, recreational businesses, ranching, and guides and outfitters are examples. Without Forest resources, these people would have a difficult time maintaining their preferred lifestyle.

Another aspect of lifestyles is the more amenity-oriented activities in which people participate, such as hunting, fishing, backpacking, picknicking, berrypicking, and gathering wood. These activities are also dependent upon Forest resources, although the impact may be more subtle and less quantifiable than jobs or income. These activities, however, are important to the lifestyle of many local, regional, and national people.

b. Economic Stability

The ability to maintain a viable economic base to ensure the existence of historical trades and professions within the zone of influence characterizes this variable. Economic stability enables a community to maintain or enhance a way of living which may be financially dependent upon particular resource-related work" (Bowen, et. al., 1978). Loggers, guides and outfitters, ranchers, and recreational businesses are often quite dependent upon the natural resources for their livelihood.

2. SOCIAL ZONES OF INFLUENCE

The social geography of the Flathead National Forest zone of influence can be considered relatively equivalent to the Flathead River Basin, with the addition of the Missoula community area. In the actual Input-Output modeling to determine the effects on income and employment for each alternative, the zone of influence included Flathead, Lake, and Missoula counties. People from these counties are most likely to be affected by Forest management activities. In this zone of influence, community units exist which consist of persons in social interaction within a geographic area and having one or more common ties. These community units have been delineated specifically to understand people's relationships with and perceptions of the Flathead National Forest, as well as to aid in the analysis of the effects of Forest management on people. The following is a description of these units:

> The heart of the zone is the upper Flathead Valley; a broad expanse centered in Flathead County, where the communities of Kalispell, Whitefish, and Columbia Falls are located. This valley is the confluence of several major drainages feeding into the main stem of the Flathead River - the North Fork Valley, Smith Valley, Swan Valley, Stillwater Valley, and Badrock Canyon/Middle Fork Valley. In each drainage are several outlying, small communities and a rural population, all closely tied to the social, commercial, and occupational centers in the Flathead Valley. For the most part, the political jurisdiction of the upper Flathead drainage is Flathead County. The Flathead National Forest rings the perimeter of the Valley; management of Forest lands directly or indirectly impacts everyone living and working in the area.

Flathead Lake, rimmed with residential and recreational homesites and small communities, separates the upper Flathead from lower Flathead Valley. The lower valley is less oriented toward the Forest and more toward "the Lake" and Valley bottom. The trade center for this area is Polson, a resort community at the southern end of Flathead Lake. A series of small communities closely parallel the highway running north/south through the center of the broad, fertile valley. The lower Flathead Valley lies in Lake County and is dominated by Salish-Kootenai Confederated Tribal lands, the Flathead Indian Reservation. Flathead National Forest lands lie to the east, in the Mission Mountain Range, and to the northwest.

The Missoula community area is south of the Flathead Basin. It lies south of Flathead National Forest lands. Still, the particular composition and structure of that community population ensures that residents orient toward Flathead National Forest, whether in active use of Forest resources or in expressed concerns about Forest management direction and activities. The city of Missoula itself is surrounded by Lolo National Forest, so residents also orient toward that National Forest.

Descriptive sketches of the local "community units" are included in the "Social and Economic Overview" available in the planning records. These are also briefly summarized in Chapter III of the EIS Volume 1.

CHAPTER VI. ANALYSIS PRIOR TO DEVELOPMENT OF ALTERNATIVES

A. INTRODUCTION

This analysis process included compiling data (issues concerns, demand projections, the current situation assessment, etc.), and using the FORPLAN model to process and/or develop information on Forest output production capability, economics, and resource interrelationships.

During the Analysis of the AMS (Analysis of the Management Situation), resource supply potentials were determined by establishing minimum and maximum production levels called benchmarks. A point of reference was also defined from which the costs and effects of applying regulations and policy constraints were measured. Production capabilities were determined for single resources as well as for sets of multiple resource outputs produced in the most cost-efficient way. This analysis established the benchmark levels required by National planning direction. Those benchmarks served as references from which the costs and effects of various objectives and constraints used in developing alternatives were evaluated.

The benchmark analysis was performed prior to the formulation of alternatives and used the FORPLAN model. The purposed of the benchmark analysis was fourfold:

- Estimate the schedule of management activities, resource outputs, effects, discounted benefits and costs, PNV, and acreages of prescription assignments appropriate to achieving the purposes of the benchmarks;

- Define the resource production levels associated with maximizing single resource outputs;

- Analyze the implications of legal and policy constraints; and

- Comply with the analysis of minimum management requirements of 36 CFR 219.27.

In order to fulfill these requirements, the Forest developed three types of benchmarks. These are:

- Maximum Present Net Value Benchmarks - Maximizes present net value for the Forest and displays the associated resource outputs.

- Resource Benchmarks - Defines the maximum potential for timber production, elk, and wilderness.

- Minimum Level Benchmarks - Defines the minimum outputs associated with custodial management of the Forest and the unavoidable costs and benefits of public ownership.

Several variations of the Present Net Value and Resource Benchmarks were run to determine the opportunity cost and resource tradeoffs of meeting specific constraints, objectives, regulations, and policies. In addition to these requirements, all benchmarks were designed to be approximatley implementable, were not constrained by budget, and generally used a maximization of PNV as the objective function to obtain a fixed analytical solution.

B. DEVELOPMENT OF MANAGEMENT REQUIREMENTS

In order to perform the stepwise analysis in the benchmarks, various sets of management requirements were modeled in FORPLAN in order to insure that the purposes of the benchmark analysis could be achieved. These management requirements were divided into three categories: MMR's (minimum management requirements); timber policy requirements; and maximum resource output constraints. The management requirements were incorporated into FORPLAN in two ways. First, many of the standards and guidelines for prescriptions were developed to include specific management requirements. These requirements are included in FORPLAN as cost and yield table variations reflecting management under these assumptions. Second, various management requirements were incorporated into FORPLAN by imposing constraints on the linear program. These constraints were used to insure that outputs, effects, and Forest conditions will be produced in the proportions required to achieve the particular purposes of a benchmark.

In linear programing analysis, constraints override the objective function. Thus, if a predetermined level of outputs or minimum physical condition is entered as a constraint, it is always achieved (or no feasible solution is found). Output levels and other desired effects entered as constraints, then, are implicitly assumed to contribute more to public benefits then the sum of their cost of production plus the foregone contribution of public benefits of any outputs they replace in the solution. In the design of the benchmarks, care was taken to ensure that the effects of various constraints or sets of constraints on PNV could be quantified, and that these constraints constituted the most cost-efficient method for attaining the desired results. Following is a discussion of the management requirements used in the Flathead FORPLAN model:

> The minimum management requirements in 36 CFR 219.27 were identified and incorporated into the planning process. Several of the minimum management requirements are a part of the design for management prescription assigned in the FORPLAN model to benchmarks and alternatives. In addition, a set of modeling constraints were developed for FORPLAN to approximate the effects of MMR's which could not be tied to management prescriptions. Following is a discussion of how each minimum management requirement was incorporated.

Following are the constraints used in modeling the benchmarks:

1. MINIMUM MANAGEMENT REQUIREMENTS

Details on specific constraints can be found in Section C (BENCHMARKS). The following discussion describes the minimum management requirements which were built into prescriptions and not explicit FORPLAN constraints.

a. Conservation of Soil and Water Resources

The basic soil, water quality, and water yield resources were protected by the application of specific management standards, guidelines, and practices integrated within management prescriptions, and acres of harvest constraints in the FORPLAN model. Explicit harvest constraints are applied to limit the amount of timber harvest by slope class on each Ranger District. These constraints are necessary because the economic objective function causes all the timber in valley bottoms to be cut first to maximize profit. These constraints are discussed in more detail in the Benchmark Section of this chapter.

Other soil and water standards are reflected in structuring appropriate vegetative management practices to be applied to landtypes and vegetative types. Fore example, shelterwood even-aged management is the optimal silvicultural system on warm dry habitat types, but it is not applied to certain landtypes where trees are subject to windthrow due to limited rooting depths. Skyline logging costs and prescribed burning are assigned to landtypes with soils subject to compaction by tractors. Clearcutting is not applied to certain vegetative types where it would cause regeneration problems. Other standards, such as most "Best Management Practices" for water quality protection are incorporated through appropriate cost coefficients. An example is costs for appropriate engineering design of roads and for revegetation of of disturbed areas.

This methodology provides a baseline necessary to protect the physical integrity of the land and water systems. Soil resources were protected by employing standards, guidelines, and practices within the management prescriptions which called for land disturbing activities (i.e., timber harvesting and road construction). These standards and guidelines are incorporated into the Forest Plan under soil and water standards known as "Best Management Practices" and "Landtype and Vegetation Management Guidelines." In addition to providing minimum management requirements within prescriptions, the standards limit the application of prescriptions to areas of land that are capable of supporting the practices. These minimum management requirements are detailed in "Rules for Assigning Prescriptions to Analysis Areas" available in the planning records. These measures were incorporated into the model to protect the basic productivity of the soil.

b. Minimize Hazards from Flood, Wind, Wildfire, Erosion, or Other Natural Physical Forces

The Forest-wide management standards and guidelines incorporated in management prescriptions and assignment of prescriptions to analyses areas include the necessary mitigation and protection from the above hazards. Appropriate costs for slash disposal, fire and fuels management, fire prevention and suppression, air quality and smoke management, water monitoring, reforestation, etc., are included in each prescription.

c. Reduce Hazard From Pest Organisms

Activities to prevent conditions favorable to pest organisms are included in management prescriptions. Cost for coordination, annual pest surveys, evaluations, and appropriate integrated pest management are included in appropriate prescriptions.

d. Protection of Riparian Zones

Riparian areas are protected by specific management prescriptions, Forest-wide Standards, and standards, guidelines, and practices within the management prescriptions. All identified riparian areas are managed to protect riparian ecosystem resources with prescriptions specific to riparian areas. Uneven-aged selection harvests are prescribed to maintain vegetative cover and provide old-growth wildlife habitats, standards for engineering of roads to provide for fish passage for roads crossing streams, and for mitigation and revegetation of disturbed areas.

e. Diversity

Animal and vegetative diversity is currently very high and is well distributed on the Forest. Diversity is maintained through a combination of old-growth maintenance and harvesting stands of old-growth trees to replace them with young trees. Minimum old growth potential is provided by special classifications, such as Wild and Scenic Rivers, Research Natural Areas, Jewel Basin, and wildernesses, in conjunction with old-growth objectives for riparian areas in all benchmarks and alternatives.

f. Adequate Fish and Wildlife Habitat to Maintain Viable Populations

Fish - The fishery habitat to maintain minimum viable populations was met by the application of the riparian prescriptions. Appropriate costs for minimal practices to maintain minimum viable populations are included. Practices include opening debris jams to permit fish passage and bank stabilization.

Wildlife - One or more selected indicator species are used to represent groups of wildlife species that have similar biological requirements. Ten species were selected as indicator species. Species selected are either impacted by management direction or are the emphasis in management direction. Endangered, threatened and/or sensitive species were included. Maintenance of minimum viable populations of wildlife was a part of the design for management prescriptions. As a result, all alternatives and benchmarks maintain at least those minimums. Appropriate costs for monitoring, maintaining minimal road closures, and wildlife coordination, biological assessments, etc., are included in all appropriate prescriptions. Soil and water constratins along with big-game winter ranges not available or unsuitable for timber management will provide minimum viable big-game populations with additional explicit FORPLAN constraints.

Three wildlife indicator species, barred owl, marten, and pileated woodpecker, are dependent on old-growth ecosystems. Old growth is discussed in item e.

g. Consistency with Multiple-Use Laws

The Secretary of Agriculture under various laws is directed to administer National Forests for multiple uses such as outdoor recreation, range, timber, watershed, wildlife, fish, and minerals. The Secretary is also directed to develop and administer the renewable surface resources.

Forest planning and environmental analyses require that processes formerly used to make individual resource decisions must be combined into integrated management decisions. Appropriate costs for interdisciplinary analysis, resource coordination, and public involvement are included in all prescriptions.

The riparian zone diversity, and fish and wildlife MMR's address how multiple-use and sustained yield is achieved. The reforestation MMR provides for maintenance of a sustained yield of timber without impairment to the productivity of the land.

h. Protecting Threatened and Endangered Species Habitat

Gray wolf, peregrine falcon, grizzly bear, and bald eagle are threatened and endangered species for which habitat has been identified on the Forest. The Regional Guide directs the Forest to evaluate the capacity of supplying habitat for these species. Adequate prey base of big game (elk and deer) is discussed above. Availability and quality of habitat for grizzly bear and gray wolf was determined for each alternative and benchmark by evaluating prescriptions' effect on the habitat. Peregrine falcon and bald eagle are protected through Forest-wide policy and standards. Practices for threatened and endangered species habitat coordination, biological assessments, habitat mapping, analysis, and protection are included in all prescriptions applied to occupied habitat.

i. Providing for Utility and Transportation Rights-of-Way and Corridors

Land-disturbing activities such as timber harvest, land clearing, road construction, pipeline trenches, and holes for power poles occur when providing rights-of-way. An analysis outside FORPLAN and prescriptions defined the kinds of land which should be excluded or avoided in permitting or constructing linear corridor facilities. Avoidance areas are areas where establishment and use of corridors conflicts with land use or management objectives such as cultural or historic sites, wildernesses, Research Natural Areas, and scenic areas.

j. Road Construction Standards

Access roads are necessary for efficient timber harvest, but road construction affects the soil, water, visual, and riparian resources. The variables considered to establish road standards are road density per square mile and road design requirements. Also, user safety is a major concern. Therefore, deciding road standards is a multidisciplinary function. Some of the parameters used when establishing road standards are, seasonal needs, environmental concerns, vehicle design, traffic volume, traffic type, and harvesting equipment.

Minimum road design considered type of road, clearing width, width of road, and grades. The minimum standards for each slope class are as follows:

Slope Class	Yarding Method	Yarding Distance	Road Density	Road Spec.
0 - 39%	Tractor	1,000'	5.2 mi/mi^2	12 ft. w/o ditch
40 - 59%	Jammer	750'	7.0 mi/mi^2	12 ft. with ditch
40 - 59%	Skyline	1,000'	5.2 mi/mi^2	14 ft. w/o ditch
60% +	Skyline	2,000'	2.6 mi/mi^2	14 ft. with dtich

The national direction for road design is contained in FSH 7709.56. Forests engineers use this policy and adapt it for the local conditions. From a functional standpoint, roads are categorized into three types - arterials, collectors, and locals. On the Flathead National Forest, all the arterials are built and most all of the collectors are built.

Mitigating measures will be applied to newly constructed roads and road maintenance to help maintain water quality and reduce damage to fisheries by limiting the amount of sediment that enters the streams. Some measures are applied to all roads while others are for sections such as within riparian zones or within sediment-contributing areas adjacent to active channels. The sediment mitigating guidelines for roads are on file in the Forest planning records. These guidelines are included in management prescriptions and Best Management Practices Forest-wide Standards.

k. Revegetating Temporary Roads

Short temporary roads are sometimes needed to efficiently transport logs; however, they can affect soil and water resources. The road density for the Forest's transportation system and log skid distances were designed to preclude the use of temporary roads in most cases. The minimum requirement is to reestablish forage or grass cover by seeding. Revegetation is included in the practices for prescriptions that disturb the soil, and appropriate costs are included.

l. Maintaining Air Quality

This requirement was handled outside of FORPLAN. The Regional Guide directs the Forest to work through cooperation agreements with the States to manage smoke emissions. Scheduling the time and number of prescribed burns is done in cooperation with the State of Montana and Glacier National Park and the costs of the coordination are included in implementation cost coefficients.

m. Reforestation

On the Flathead, there is reasonable assurance of regeneration in 5 years on most harvested areas for high productivity (cool, moist) site classes. Planting is generally needed to supplement natural regeneration on low productivity (warm, dry) sites. Fill in planting is included on low productivity harvest prescriptions as a minimum management requirement. Fill in planting of 50 percent of the minimum required stocking level of 200 trees per acre is included in timber harvest prescriptions. All other planting is considered a timber investment for species diversity, increased timber values or volume production. Minimum stocking levels are specified in the Forest-wide Standards for vegetation management.

2. TIMBER POLICY REQUIREMENTS

a. NDY (Nondeclining Yield)

NDY is a constraint on timber outputs which limits the per-period harvests to levels greater than or equal to the preceding period level. This constraint was used to ensure a constant even flow of timber harvest levels throughout the planning period for all alternatives to establish the base harvest schedule. The effect of relaxing the NDY constraint is examined in departure alternatives.

b. Sequential Upper and Lower Bounds; Harvest Floors and Ceilings

In lieu of the NDY constraint on timber outputs, sequential upper and lower bounds and floors and ceilings were used to constrain the harvest flows to reasonable levels in specific benchmark runs. Floors and ceilings were used to establish a parameter on first decade timber harvests which would not invoke substantial change in local consumptive patterns. Floors are a lower limit which may be a necessary limit on harvests to offer a level of reasonableness in a benchmark. Normally this limit is imposed in a benchmark on the first decade only, allowing the objective functions and other constraints to control the solution beyond the first decade. Ceilings are an upper limit, only to be imposed for the same reasons as the floor. The timber harvest floor of 101 MMBF/Yr. used for the Flathead National Forest benchmark was calculated as 80 percent of the RPA target averages for the Flathead over the 50-year planning period as a reasonable floor considering both local and National needs. This floor is equal to the last 10-year average harvest. Ceiling constraint was calculated as the normal mill capacity for the Flathead zone of influence. These floors and ceilings along with sequential upper and lower bounds of ±20 percent of the previous harvest decade harvest levels were the constraints necessary to assure timber outputs would not create "rapid change" in the local economy.

c. Rotation Based on 95 Percent CMAI

Timber rotation lengths based on 95 percent of the CMAI (culmination of mean annual increment) for existing and regenerated stands is required by 36 CFR 219.16(2)(iii). The Forest Service is directed to analyze timber rotation lengths based on the time required for stands to reach the culmination of net growth. CMAI assures that all stands scheduled for harvest have reached this level. CMAI was used to constrain the period of first harvest for timber prescriptions in the FORPLAN model.

d. Rotation Based on Utilization Standards

In order to evaluate the effects of timber rotation lengths constrained by CMAI, rotation lengths based on Regionally proposed utilization standards were used to determine what, if any, change in timber harvest levels or PNV could be attributed to the more constraining CMAI levels.

3. MAXIMUM RESOURCE OUTPUT OBJECTIVES

Maximum resource output constraints were used to determine the physical or biological potential of achieving specific resource outputs for the Forest, and the resulting impact on other resources or programs. The outputs chosen for this analysis were timber, range, wildlife, PNV, and wilderness. The resource outputs were maximized by first assigning FORPLAN an objective function to maximize the particular output, locking in the resulting scheduled output, and rerunning FORPLAN with the objective function of maximizing PNV.

C. BENCHMARKS

The benchmark analysis defines the range of options within which Forest Plan alternatives can be developed. There are three primary objectives of benchmark analysis:

- Define the maximum economic and biological resource use and development opportunities.

- Evaluate the Forest's capabilities between priced and nonpriced objectives.

- Evaluate the ability to respond to major issues and concerns.

The FORPLAN linear program can find the combination of land use and management practices which will maximize or minimize the total production of any scheduled output such as timber. The program can be used to either minimize costs or maximize profit as measured by PNV (Present Net Value). The item to be maximized or minimized in a FORPLAN run is called the "Objective Function."

A mathematical solution produced by solving the problem on the basis of an objective function alone is usually very theoretical and inappropriate to apply in practice. Constraints are used to limit the solution to a range that meets legal requirements and is physically possible to implement. Constraints are also to control the production of outputs desired other than the one being maximized or minimized. Benchmark analysis is the process of defining the mathematical solutions and change due to various constraints. The change in PNV between runs with added constraints is used to express an economic opportunity cost or tradeoff of the added constraints. The benchmarks define the physical, economic, legal, and environmental boundaries (often called "decision space") within which implementable alternatives can be formulated. (The minimum management requirements specified in 36 CFR 219.27 incorporated into management prescriptions are described in VI, B.) The benchmark analysis process is also useful in understanding the mathematical relationships in the FORPLAN data.

Often more than one run of the FORPLAN model is necessary to analyze or "calibrate" increments of opportunity costs of constraints necessary to produce the benchmark displayed in the body of the EIS. Displayed benchmarks are titled "benchmarks" and calibration runs are titled "variations" in the documentation that follows. Assumptions regarding demand, monetary values, and Minimum Management Requirements described in Part B above apply to the benchmarks.

The benchmark analysis process is documented below by describing the purpose and objectives of each calibration run, the FORPLAN objective function and constraints used to accomplish them, and the analysis results and conclusions for each of the analytical runs. Detailed comparisons of benchmark outputs are found in Table B-25.

1. MINIMUM LEVEL BENCHMARK (219.12(e)(1)(I))

Purpose: The Minimum Level Benchmark is to quantify the natural or "background" outputs the Forest would produce if there were no active management programs. The objectives of the Minimum Level Benchmark are to minimize costs while protecting the basic productive potential of National Forest System lands, protecting existing capital investments and providing minimal public safety and service functions required by law. It provides an estimate of the unavoidable costs associated with maintaining the Forest as part of the National Forest System. The Minimum Level Benchmark is displayed in the body of the EIS as a basis for comparing the change in resouce outputs, environmental effects, and costs that result from the multiple-use objectives of alternatives. Only one FORPLAN run is required to produce the benchmark.

Objective function is to minimize cost for 15 decades (Run ID 110MLV).

Constraints: Minimum management prescriptions are assigned to all acres not legally classified as wilderness or other special area. The minimum management prescription consists of standard management activities (as specified by MIH Code in RO memo 1920, Aug. 6, 1981) that meet legal requirements and protect existing assets.

Results and Conclusions: The budgetary cost of maintaining the Flathead National Forest as public land in the National Forest System is estimated to be $2.8 million per year. The Forest would sell no timber or other permits (area classified as suitable for timber harvest is zero), no roads or other support facilities would be constructed, developed recreation sites would not be operated, and only minimal services of any kind would be provided to the public. Dispersed recreation capacity would decline to 788,000 RVD's per year (less than half the potential), overwintering elk capacity would decline to 4,041 elk by Decade 5 (less than half the winter range potential, and grizzly bear potential) would climb to 212 bears over the long term due to the reduced use of the habitat by people. The PNV of the Forest would be approximately $100 million. Benefits resulting from the land under a caretaker type of management with no management induced outputs are from fish and wildlife and dispersed recreation use. The benchmark is useful for comparing the costs and outputs produced by the management objectives of the various alternatives.

2. MAXIMUM PRESENT NET VALUE BASED ON ESTABLISHED MARKET PRICE (219.12(e)(1)(iii)(A))

Purpose: These variations of the monetary benchmark are to estimate the maximum present net value of the Forest's resource outputs with established market prices. Objectives of these calibration runs are to examine the harvest scheduling patterns and associated resource outputs and how they change subject to added constraints due to the economics of the established market prices only. These variations will serve as a basis for comparing the change due to the addition of assigned values to the model. Assigned values for resources which do not have established market prices such as wildlife and recreation are often controversial, so it is important to know how the values affect the basic behavior of the model. Market values include timber, range, and developed recreation for which a fee is charged.

At the time these variations were run, no specific runs were conducted allowing timber harvest prior to CMAI (Culmination of Mean Annual Increment) using timber values only. Runs were conducted to test harvesting prior to culmination using both established price and assigned values (see 3. below), that showed the CMAI requirement of 219.16(a)(2)(iii) is not constraining the timing of timber harvest on the Flathead National Forest. The relationship of culmination in the rate of timber stand volume growth and the culmination of the value of the timber is established by the timber volume and economic tables, and inclusion of assigned values will not affect that relationship. Since the FORPLAN runs to test harvesting prior to CMAI are very expensive, and the proven relationship of increasing timber value per unit of volume with increasing average diameter and volume per acre, it was concluded that additional runs evaluating the CMAI constraints with market and assigned values are not needed. Each calibration run using established prices for timber is described below:

Variation 1 is an "unconstrained" run for the purpose of estimating the maximum theoretical value to the Forest's timber resource on all available and tentatively suitable timberlands.

Objective Function: Maximize Present Net Value for 15 decades (Run ID 110MP1).

Constraints: Only constraints for harvesting timber stands at or beyond the end of CMAI are used.

Results and Conclusions: About 748,000 acres were scheduled as theoretically economically appropriate and suitable for timber harvest of the Forest's 835,747 tentatively suitable timberlands. The run produced a Decade 1 harvest of about 12 million board feet per year, then increases to a peak of 620 million board feet per year in Decade 5 before declining to 51 million board feet per year in Decade 15. A long-term sustained yield capacity of approximately 152 million board feet per year was produced, but inventory at the end of the planning horizon is not adequate to sustain this level (less than half the beginning inventory).

The timber harvest schedule which holds merchantable timber on the stump in early decades is due to the economic objective function maximizing the difference between total discounted dollar returns and total discounted dollar costs for the 150-year planning horizion. There are several factors that interact to produce a situation where the average timber stumpage value per acre for most existing sawtimber stands are increasing in value at a rate in excess of the 4 percent discount rate used in FORPLAN. The following factors contribute to this value growth:

a. Timber inventory data shows that average net mean annual growth is positive resulting in increasing merchantable volume per acre.

b. Average d.b.h. of sawtimber stands increases over time.

c. Production costs per unit of volume decreases as average volume per acre and stand d.b.h. increases.

d. Timber value per unit of volume increases as average d.b.h. increases. (Peelers worth more than sawlogs, etc.)

e. The real value per unit of volume is projected to continue to increase at a faster rate than production costs for the next 50 years as they have in the past.

The run produced a Present Net Value of 433.6 million dollars. It can be concluded that the Flathead National Forest has a substantial inventory of tentatively suitable timberlands which have the economic potential to produce a real return on investments equal to or exeeding the historic average real return of corporate bonds (4 percent). In addition to providing a "theoretical" estimate of the value of the timber resource on the Forest, the benchmark is useful for the purpose of estimating opportunity costs by comparing subsequent runs which add additional constraints. From examination of the schedule of timber harvest it is obvious that an "unconstrained maximum PNV timber harvest schedule" will not be an implementable solution. The lack of ending inventory causes excessive harvesting in period 14. The remaining sawtimber on gentle terrain offers the greatest potential to maximize PNV because the costs of timber management and harvest are much less than similar stands on steep slopes. As a result, the objective function causes scheduling all the remaining sawtimber on analysis areas with less than 40 percent slope in early decades. Such a schedule would not provide adequate timber stand diversity nor would it consider size of opening requirements. It is also apparent that the objectives of some multiple-use prescriptions, such as wildlife cover or visual landscapes, will cause tradeoffs of economically efficient timber harvest. The run was also useful in evaluation and validation of the basic components of the model such as resource yield tables and economic tables, and to determine if the interaction of the data produced reasonable results.

Variation 2 is a run to examine the timber harvest schedule and associated outputs based on maximizing PNV for resources with established market price without base sale schedule constraints. This run also begins to examine the effects of adding explicit timber harvest constraints necessary to limit the economic objective function to a range that will meet legal requirements (timber policy and minimum management requirements) and be physically possible to implement.

Objective Function: Maximize PNV for 15 decades (Run ID 110MP5).

Constraints: This variation adds the ending inventory long-term sustained yield capacity (EIC/LTSYC) link. The run also adds timber inventory constraints that require big-game cover requirements to be maintained on lands assigned to winter range emphasis. Variation 1 had both winter range management and timber management emphasis prescriptions on analysis areas capable for winter range, but no constraints on timber harvesting to assure the habitat cover objectives are maintained over time. Variation 2 also adds constraints limiting the amount of timber harvest scheduled on land assigned to a retention visual management objective. The FORPLAN model can avoid any costs due to the constraints associated to a particular management emphasis by assigning a timber management emphasis which has no associated constraints.

Timber inventory and timber under contract data was used to develop constraints to limit the disproportionate timber harvest scheduled from less than 40 percent slope timberlands for the first three decades. After three decades it is assumed harvest opportunities will be available in stands that are not currently financially mature and distribution of timber harvest will not be a problem. The run uses an ending inventory constraint and harvest at CMAI (culmination of mean annual increment) identical to Variation 1.

Results and Conclusions: Lands assigned to timber harvest under a big-game winter range management emphasis declined substantially compared to Variation 1. Examination of the timber inventory constraints in solution reveals that no acres were scheduled for harvest under mule deer, elk, or whitetailed deer winter range emphasis which had an effect on the PNV objective function solution. The inventory constraints were not binding on those acres actually scheduled for harvest. This demonstrates that there is an opportunity for some timber harvest on winter ranges that is not in conflict with timber harvest efficiency or winter habitat objectives. Conversely it can be concluded that since FORPLAN only assigned 3,500 acres for management as winter range compared to 27,000 acres in Variation 1, that there will be a cost in potential PNV from timber harvest in order to manage the Forest's 57,658 acres of potential winter range near its potental for desired cover/forage conditions.

Similar to the conclusions from winter range constraints, Variation 2 assigned less than one third as many acres of timber harvest under a retention VQO as Variation 1, and only scheduled acres where the constraint was not affecting the PNV objective. Due to the fact that the assignments of management emphasis associated with those constraints decreased substantially compared to the unconstrained Variation 1, it is concluded that alternatives that include objectives for these management emphases at a higher level than represented in Variation 2 solution will result in some opportunity cost to PNV.

Variation 2 produced a PNV of 403.2 million dollars, a reduction of $30.4 million compared to Variation 1. This reduction represents the opportunity cost of constraints needed to provide for an ending inventory necessary to provide for sustained yield after Decade 15.

Other key results are a first decade harvest of 16 million board feet per year increasing to a peak of 530 MMBF/year by Decade 5, then decreasing to 90 MMBF/year by Decade 15. The harvest was scheduled from 751,258 suitable acres, as increase of 2,700 over Variation 1. A long-term sustained yield capacity of 146.4 MMBF/Yr. was produced. The effect of constraining the amount of harvest in later decades to provide an ending inventory is to reduce the timber harvesting peak in Decade 5, increase the total volume and area harvested in ealy and late decades. The constraint results in timber harvest being scheduled on more potentially suitable acres to maximize PNV of the timber resource. The results of Variation 2 also support the reasonableness of the the results from interaction of the basic data components of the FORPLAN model. Variation 2 will serve as a basis for comparison of the effects of imposing contraints for producing a base sale schedule (nondeclining even flow policy) for timber harvest.

Variation 3 has a purpose of estimating the maximum present net value for resources having established market value constrained by the base sale (nondeclining yield) schedule requirements described by CFR 219.16(a)(1). In addition to estimating the opportunity cost of the base sale schedule policy constraint, the run will examine how other resource outputs and costs change as a result of the nondeclining timber harvest policy is applied to the Forest.

Objective Function: Maximize PNV for 15 decades (Run ID 110MP4).

Constraints: In addition to the constraints in Variation 2, Variation 3 adds a constraint that requires the timber harvest volume for any future decade to be equal to or greater than the harvest volume of the preceeding decade (nondeclining yield, NDY Constraint).

Results and Conclusions: The base sale schedule harvests 53.2 MMBF per year in Decade 1, increases to 140.4 MMBF per year in Decade 2 and rises to a constant 173.5 MMBF per year in Decades 3-15. The harvest schedule was produced from 766,569 suitable acres with a long-term sustained yield capacity of 188.9 MMBF per year. The run produced a PNV of $387.8 MM dollars.

By comparing the results to Variation 2 it can be concluded that the opportunity cost of nondeclining yield on the Flathead National Forest is $15.4 million dollars and that the nondeclining even flow policy does not constrain the potential timber yield of the Forest. A larger suitable timberland base (approximately 15,000 acres more) is required to maximize PNV on the Forest with NDY constraint, and the LTSYC (Long-Term Sustained Yield Capacity) is increased by nearly 40 MMBF per year. The constraint reduces the size of fluctuations in timber harvest from decade to decade, but changes of 87 MMBF per year between Decade 1 and 2 would still be difficult to implement.

The results also show that the Flathead is not an "old-growth surplus" Forest. The fact that the basic pattern of the harvest schedule increases over time to a sustainable level rather than remaining at the same level over the 15 decades shows that the rate of growth on existing stands is not so far below the potential of the land that future harvests are constrained when NDY is imposed.

It is noted that the addition of the NDY constraints on the timber harvest schedule causes the suitable timber base to increase again over Variations 1 and 2, but there is still 71,000 acres of the tentatively suitable land base where timber harvest is not cost efficient. The benchmark is also useful for comparison purposes as an estimate of the upper bound for the market value PNV of a cost-effective timber management program formulated under base sale schedule policy. Multiple-use alternatives with objectives for nonmarket outputs which further constrain economically efficient timber harvest scheduling will have market value PNV reductions below this potential.

3. MAXIMUM PRESENT NET VALUE INCLUDING ASSIGNED VALUES (219.12(e)(iii)(B))

Purpose: This series of calibration runs is to estimate the maximum potential present net monetary value of the Flathead's resources which have either an established market price or assigned monetary value. The benchmark will also estimate the scheduling patterns and costs for both market and nonmarket resource outputs that would result based on the economic objective function. Values are assigned to various types of recreation visitor days including hunting and fishing as proxies for fish and wildlife values (see Appendix B, Part IV, B, 2 for details on assigned values).

Objectives of this series of runs include establishment of the change in PNV and schedule of outputs that results when assigned values are added to established market price values, and to calculate the opportunity costs of constraints necesssary to formulate an implementable maximum monetary benchmark that includes all costs of management and all market and assigned dollar benefits. The benchmark displayed in the EIS will provide a good basis for comparing alternatives which incorporate objectives for resource outputs other than through the economic objective function. Each variation involved in the continuing calibration of the monetary benchmark displayed in the EIS is described below:

Variation 4 has a purpose of estimating the theoretical value of the resources with assigned values and to examine the effect of the assigned values on the timber harvest schedule, costs, mix of uses, and other resource outputs. The run is identical to Variation 2, except the assigned values are added to the model.

Objective Function: Maximize Present Net Value for 15 decades (Run ID 110MP6).

Constraints: Constraints for big-game winter range cover on lands managed as winter range, limits on the amount of land harvested in any decade managed with retention visual quality objective, limits on harvest schduled on less than 40 percent slope, CMAI, and ending inventory are used identical to Variation 2, above.

Results and Conclusions: The sale schedule harvests 16 MM/Yr. in Decade 1 increases to a peak of 632 MM/Yr. in Decade 5, then declines to 56 MM/Yr. in Decade 11. The harvest schedule was produced from 790,400 suitable acres with a long-term sustained yield capacity of 154.9 MMBF/Yr. The variation produced a PNV of $693.4 MM.

By comparing the results to Variation 2, it can be concluded that the assigned recreation and wildlife values add $290.3 MM to the PNV of the Forest. The added values result in an increase of 39,142 acres in the suitable timber base and an increase of 8.5 MMBF/Yr. in long-term sustained yield capacity. The PNV is maximized by a combination of market and assigned values on more suitable acres than with market values alone. This Variation will provide the basis for determining opportunity costs associated with additional constraints necessary to formulate an implementable benchmark using both assigned and market values.

Variation 5 was formulated with dual purposes. One is to determine the effect of constraints necessary to assure that timber harvest schedules will not create "rapid change" in the existing local economy. The second purpose is to see if the NFMA requirement to harvest timber stands within 95 percent of culmination of mean annual increment is constraining to timber yields on the Flathead.

Objective Function: Maximize Present Net Value for 15 decades (Run ID 110MP8).

Constraints: Big-game cover constraints on winter range emphasis, constraints on decadal harvest from lands with retention and partial retention VQO, and ending inventory are used identical to Variation 4. CMAI is not used. Added constraints include a harvest ceiling in period 1 of 780 MMBF/Yr., a floor of 101 MMBF/Yr.

Results and Conclusions: The run produced a timber yield of 101 MMBF/YR. for the first four decades, a peak of 470 MMBF/Yr. for period 5, then decreasing to 101 MMBF/Yr. in Decade 15. The harvest was produced on 780,190 suitable acres with a long-term sustained yield capacity of 158.8 MMBF/Yr. The PNV is 683 million dollars.

Examination of the timber harvest by prescription reports revealed no timber stands which were harvested prior to culmination of mean annual increment. This means that the economic rotation on the Flathead is always at or after culmination of volume growth and the requirement to harvest at 95 percent of CMAI does not constrain timber schedules and has no opportunity cost.

Since relaxing the CMAI constraint did not affect the solution, and since the Decade 1 harvest ceiling is not constraining, the change in PNV of $10.4 MM represents the opportunity cost of the harvest floor of 101 MM/Year on the Flathead. The harvest floor is necessary to assure that Decade 1 timber harvest does not cause rapid change in the local timber economy from the current situation. The harvest schedule produced has a more than fourfold increase between Decade 4 and 5 which would cause rapid change in the economy at that time. It is evident that constraints to limit the change in scheduled timber harvest between decades is needed. This variation will provide the basis for determining the opportunity cost of decadal timber harvest constraints.

Variation 6 is a PNV calibration to estimate the opportunity cost of adding constraints necessary to ensure that timber harvest flow does not change unreasonably between decades.

Objective Function: Maximize Present Net Value for 15 decades (Run ID 110M9A).

Constraints: This variation has the same constraints as Variation 5 and adds sequential timber harvest constraints to limit change between decades to 20 percent of the previous decade.

Results and Conclusions: This variation produced a timber harvest schedule of 101 MMBF/Year in Decade 1, rises fairly steadily to a peak of 229 MMBF/Year in Decade 6, then declines to 101 MMBF in Decade 15. The harvest was produced on 732,000 suitable acres with a long-term sustained yield capacity of 153 MMBF/Year. The PNV of this variation is 644.7 million dollars.

By comparing these results to Variation 5, the opportunity costs of decadal timber flow constraints is 38.3 million dollars. Examination of the timber harvest schedule reveals that Decade 1 harvest is scheduled almost entirely on lands less than 40 percent slope. PNV is maximized by harvesting Decade 1 timber with the highest value timber and lowest logging and reforestation costs. FORPLAN would harvest all the existing sawtimber on certain landtypes in Decade 1. This would maximize PNV, but it would not meet minimum management requirements for protection of basic soil and water resources and size of Forest openings. Additional constraints will be necessary to formulate a benchmark that meet legal requirements. This variation will provide the basis for comparison to determine the opportunity cost of minimum management requirements necessary to protect soil and water resources.

Maximum PNV Benchmark (assigned values) is a legally implementable benchmark that provides a basis for comparison of economic tradeoffs associated with alternative Forest management schemes. It provides the upper limit for managing the forest for profit, provides a basis for comparison to determine the opportunity costs of minimum management requirements, and timber policy constraints.

Objective Function: Maximize PNV for 15 decades (Run ID 110MPC).

Constraints: Big-game winter range cover, visual quality area harvest constraints, CMAI, timber harvest floor ±20 percent sequential upper and lower decadal harvest constraints, EIC, and soil and water harvesting constraints.

Results and Conclusions: The PNV Benchmark produced a timber schedule of 103 MMBF/Year Decade 1, increasing to 235 MMBF/Year Decade 7, then declines to 103 MMBF/Year by Decade 15. The harvest schedule was produced from 723,130 suitable acres with a long-term sustained yield capacity of 155.3 MMBF/Year. The PNV is 605.5 million dollars.

By comparing these results to Variation 6, the opportunity cost of MMR to distribute timber harvesting across slope classes to protect soil and water resources is 39.2 million dollars. By comparing to Variation 4, the opportunity cost of all timber policy and minimum management requirements totals 87.4 million dollars.

The benchmark provides economic information regarding management of the Forest's timber resource under a profit emphasis:

- None of the 41,252 acres of riparian area are scheduled as suitable.
- Only 355 acres of the Forest's 42,487 acres of stagnated timber stands would be rehabilitated and included in the suitable timber base.
- The balance of 29,233 acres not economically suitable in the benchmark is composed of low productivity lodgepole pine stands on steep slopes, and both lodgepole and mixed stands on soils sensitive to roads.
- Approximately 15,500 acres would be managed as suitable for harvest with aerial logging rather than harvested with systems requiring roads.
- No potentially suitable acres are assigned to timber management with retention or partial retention.
- Approximately 133 M acres of existing stands in the suitable timber base would be managed intensively with 3,300 acres of precommercial thinning/year scheduled in Decade 1.
- All regenerated stands are managed intensively with at least one precommercial thinning and one commercial thinning scheduled.
- Winter range management is compatible with PNV objectives on 2,115 acres of the Forest's 57,658 acres of potential winter range.

A summary of all the PNV analytical FORPLAN runs and the constraints used is displayed in Table B-22.

TABLE B-22 Monetary Benchmark Constraint Summary
Flathead National Forest

BENCHMARK		CONSTRAINTS						
ID#	Values	Obj. Func.	EIC	CMAI	Timber Floor and Ceiling	Upper and Lower Bounds	NDY	MMR
110MLV	Market & Assigned	Min Cost	NA	NA	NA	NA	NA	NA
110MP1	Market	Max PNV	Y	Y	N	N	N	N
110MP5	Market	Max PNV	Y	Y	N	N	N	N
110MP4	Market	Max PNV	Y	Y	N	N	Y	N
110MP6	Assigned	Max PNV	Y	Y	N	N	N	N
110MP8	Assigned	Max PNV	Y	N	Y	N	N	N
110M9A	Assigned	Max PNV	Y	Y	Y	Y	N	N
110MP0	Assigned	Max PNV	Y	Y	Y	Y	N	Y

4. CURRENT LEVEL BENCHMARK (219.12(e)(2))

Purpose: The Current Level Benchmark is designed to show the management most likely to be implemented and the level of outputs that would be produced if current direction as stated in existing management plans and policies was followed. This benchmark is the same as the "no action" alternative (Alternative 7).

Objective Function: Maximize Present Net Value for 15 decades (Run ID 110C6A).

Constraints: Big-game winter range cover, visual quality area harvest constraints, CMAI, NDY and EIC. In addition, first period timber harvest minimum of 307.5 MM cu. ft. equivalent to the allowable sale quantity of the 1969 Flathead Timber Management Plan as adjusted as specified in the Forest Plan and land classification changes management emphasis and intensity specified by existing plans was fixed using management prescription constraints.

Results and Conclusions: The sale schedule indicates that current direction allowable sale quantity of 132 MMBF/Year can be met in Decade 1, and increased to a sustained level of about 160 MMBF/Year by Decade 5 from the land uses specified by current Ranger District and Planning Unit Multiple-Use Plans.

The budget to implement of $14 MM per year produced through the FORPLAN model coefficients was very close to the 1980 base year and very close to the 1985 Final Budget of $14.46 MM. No additional FORPLAN run of Current Level incorporating a budget constraint is necessary.

Current Direction has an opportunity cost of 72.8 million dollars when the PNV of 532.7 million dollars is compared to the PNV Benchmark (110MPO). From the benchmark calibration runs (Variation 2 and 3), the opportunity cost of the NDY constraint was estimated at over 15 million dollars. In addition, Current Direction requires Decade 1 to schedule a first decade harvest 35 MMBF/Year higher than the timber harvest floor in the PNV benchmark which had a significant opportunity cost. The higher first period harvest constraints would result in a tradeoff of PNV.

In addition to timber scheduling differences, PNV is affected by costs associated with production of nonprices and assigned value resources. Current Direction calls for more acres to be managed for dispersed recreation, visual quality, deer and elk winter range, grizzly bear habitat, and riparian timber management than the PNV benchmark. Producing higher outputs of these resource benefits results in a tradeoff of PNV.

5. MAXIMUM RESOURCE LEVELS (219.12(e)(i)(ii))

Purpose: These benchmarks are to estimate the maximum capabilities of the Forest to provide a single resource emphasis. Each resource output that is needed to respond to the Forest planning issues is quantified with a benchmark described below:

a. Maximum Timber Benchmark (110MT3) is designed to estimate the maximum amount of merchantable wood fiber the Forest could produce. The purpose is to provide a basis for comparison of the tradeoffs in potential timber yield for alternatives formulated with various mixes of emphases on economic efficiency and other resource outputs. The benchmark was formulated with a series of variations.

Variation 1 was an unconstrained run with an objective function to maximize timber for 15 decades. This run estimates the highest amount of merchantable volume that could theoretically be produced if economics and adverse effects on the environment were not considered.

Variation 2 is the same as variation one except that the NDY/EIC constraint is added to estimate the tradedoff of this timber policy constraint when maximum volume production is the objective.

Maximum Timber Benchmark objective function is to maximize PNV for 15 decades subject to the maximum timber yields produced by Variation 2.

Constraints: EIC, CMAI, Lower limit on timber output each decade equal to output generated by Variation 2, big-game winter range cover constraints, and retention harvesting constraints.

Results and Conclusions: The maximum merchantable timber volume the Forest could produce over the next 150 years is approximately 8506.8 MM cu. ft. as estimated by Variation 1 with no constraints. Adding nondeclining yield/ending inventory constraint in Variation 2 results in a 17.7 percent reduction to 7004.8 MM cu. ft. The long-run sustained yield capacity remained the same at 50.2 MM cu. ft./year.

The benchmark produced a harvest schedule of 171 MMBF/year in Decade 1, and achieved the long-run sustained yield capacity of 200 MMBF/year by Decade 14. All 835,747 tentatively suitable acres would be managed to produce timber. The run produced a PNV of $371.5 MM. This represents an opportunity cost of $234 million dollars to produce as much timber as possible from all tentatively suitable acres. The loss of PNV results from the large investments in cultural treatments and road systems that would be necessary to produce maximum volume. The benchmark schedules 5,500 acres/year of timber stand improvement in Decade 1 compared to 3,300 acres/year for the PNV benchmark and more than double the amount of roads. The benchmark schedules alot of volume for harvest that would cost more to log and process than the value of the products would return in order to achieve maximum volume production.

Big-game winter range management is compatible with maximum timber volume production on 10,000 suitable acres. Management for partial retention visual quality is compatible with maximum timber production on only 8,000 acres of suitable land. Retention visual quality in incompatible with maximum volume production.

b. **Maximum Range Benchmark (110MR3)** is designed to estimate the maximum amount of usable range forage for domestic livestock the Forest could produce. It provides a basis for comparison of potential forage production with alternatives and benchmarks which consider economics and other resource uses. The benchmark was formulated with a series of variations.

Variation 1 was an unconstrained run with an objective function to maximize livestock forage for 15 decades. This run estimates the highest amount of forage that could be produced if economics and environmental effects were not considered.

Variation 2 is the same as Variation 1 except that a NDY/EIC constraint is added to see if this timber policy constrains or conflicts with range forage production.

Maximum Range Benchmark objective function is to maximize PNV for 15 decades subject to the range forage outputs produced by Variation 2.

Constraints: EIC, CMAI big-game winter range cover constraints, retention harvesting constraints, and livestock forage output equal to Variation 2 output each decade.

Results and Conclusions: The Forest can produce a total of 765.8 million pounds of forage over 15 decades. Nondeclining yield policy does not conflict with this potential, the same amount can be produced under NDY.

Range forage on the Flathead is transitory, that is it grows when timber stands are harvested and is shaded out when the stands regrow. Only the more gentle terrain can be grazed by livestock, so only part of the productive forest lands are also suitable for livestock grazing. The analysis shows that a relatively high timber yield starting at 138 MMBF/year and rising to 168 MMBF/year can be achieved while maximizing forage production. Winter range management is compatible on 14,500 acres and visual quality management is compatible on 22,500 acres.

The PNV of 509.1 millon dollars is 138 million dollars higher than the timber benchmark, but 96.4 million dollars lower than the PNV benchmark. The opportunity cost of $96 MM results from timber being harvested from areas where timber values do not cover costs, and timber stands harvested before economic values has peaked in order to produce range forage.

c. **Maximum Wildlife Benchmark (110MW5)** is designed to estimate the maximum amount of usable big-game winter range forage that could be produced on the Forest. The purpose of this benchmark is to provide a basis for comparison of the alternative tradeoffs in potential of the Forest's winter ranges to overwinter deer and elk. The carrying capacity of winter ranges is a key factor in providing huntable populations of big game. The benchmark is developed with a series of variations.

Variation 1 was an unconstrained run with an objective function to maximize winter range forage for 15 decades. This run estimates the highest amount of browse that could theoretically be produced if all other considerations were ignored.

Variation 2 is the same as Variation 1 except that the NDY/EIC constraint is added to see the effect of this timber policy constraint on big-game habitat.

Maximum Wildlife Benchmark objective function is Maximize PNV for 15 decades subject to the winter range forage outputs produced by Variation 2.

Constraints: EIC, CMAI, big-game winter range cover constraints, retention harvesting constraints, and winter range forage output constrained equal to that produced by Variation 2.

Results and Conclusions: The Forest could produce up to 515.7 million pounds of usable forage in 15 decades, while maintaining minimum cover requirements on winter ranges. If nondeclining yield policy is considered, the maximum drops to 203.6 million pounds. This tradeoff in total production during the entire 15 decades could not be entirely used by big game in the unconstrained schedule due to the large fluctuation in harvest activity on summer range.

The constrained schedule produces a sustained yield of winter habitat as well as a more stable summer habitat than an unconstrained schedule.

The benchmark produced a timber harvest schedule of 63 MMBF/year in Decade 1, increasing to 175 MM by Decade 3 from a suitable timber base of 767,484 acres with a long-run sustained yield capacity of 188 MMBF/year.

The PNV of 499.1 million dollars represents an opportunity cost of 106.4 million dollars. This tradeoff in PNV is due to constraints on the optimal timing of timber harvest for profit. The wildlife benchmark also schedules the roading of unroaded winter ranges earlier so browse can be maximized at a cost in PNV.

d. **Maximum Wilderness Benchmark (110MWO)** is designed to estimate the maximum amount of wilderness resources including wilderness recreation the Forest could produce. Only one FORPLAN run was needed to produce the benchmark.

Objective Function: Maximize PNV for 15 decades.

Constraints: EIC, CMAI, big-game winter range cover constraints, retention harvesting constraints, 20 percent upper and lower sequential harvest, and high intensity wilderness management emphasis assigned with prescription constraints to all 495,000 acres suitable for addition to the National Wilderness Preservation System.

Results and Conclusions: This benchmark is exactly the same as the PNV Benchmark except for the assignment of the current roadless areas to wilderness management. By comparing to the PNV Benchmark, the estimated opportunity cost of maximizing wilderness is 92.6 million dollars.

The reduction in PNV is primarily a result of reduced timber benefits from a constrained timber base of 578,000 suitable acres compared to 723,000 acres for the PNV Benchmark. There is also a loss of PNV due to recreation carrying capacities below projected future use. This results in a loss of projected recreation benefits compared to the PNV Benchmark. The Maximum Wilderness Benchmark could provide recreation capacity to meet approximately 58 percent of Decade 5 projected wilderness use, 20 percent of projected roadless dispersed recreation use, and 76 percent of roaded natural dispersed recreation use. The loss in capacity for nonwilderness recreation is not offset by the gain in wilderness recreation capacity even though wilderness RVD's are valued higher than other dispersed recreation.

D. SUMMARY OF BENCHMARK ANALYSIS

The monetary tradeoffs of the management opportunities explored during the AMS can be determined by comparing the benchmarks described in Section C. Monetary tradeoffs are limited to priced benefits.

In this section, the tradeoffs of timber harvest floors and ceilings, minimum management requirements, timber policy constraints, market vs. assigned values, additional timber modeling constraints, providing maximum resource outputs, current direction, and the minimum level are discussed. Note that the "opportunity cost" reference points vary in the benchmark discussion. Alternative comparisons will use the PNV Benchmark (110MPO) as a common reference point.

The monetary benchmark analysis and the opportunity costs of resource benchmarks are summarized in Tables B-23 and B-24 below.

TABLE B-23 Monetary Benchmark Calibration of Constraints and Opportunity Costs - Flathead National Forest

Constraint	Opportunity Costs (Millions of Dollars)	Benchmarks Compared
EIC/LTSYC	30.4	Variation 2 with Variation 1
Sequential Harvest ±20%	38.3	Variation 6 with Variation 5
NDY	15.4	Variation 3 with Variation 2
Timber Harvest Floor	10.4	Variation 5 with Variation 4
Timber Harvest Ceiling	None	Variation 5
CMAI	None	Variation 5
Minimum Management Requirements		
Watershed and Soil	32.9	Variation 1 with Variation 2
Winter Range Cover	None	Variation 2
Retention Harvesting	None	Variation 2
Market Values Only	290.3	Variation 4 with Variation 2
Minimum Management	505.5	PNV Benchmark with Minimum Level Benchmark

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TABLE B-24 Maximum Resource Output, Minimum Level, and Current Direction Opportunity Costs - Flathead National Forest

Resource Maximums	(Millions of Dollars)	Benchmarks Compared
Timber	234	Maximum Timber with PNV
Range	96	Maximum Range with PNV
Winter Range Forage	106.4	Maximum Wildlife with PNV
Wilderness	92.6	Maximum Wilderness with PNV
Minimum Management	505.5	Minimum Level with PNV
Current Direction	72.8	Current Direction with PNV

E. SUMMARY OF RESOURCE RELATIONSHIPS

Comparisons of land use assignments and resource outputs of benchmarks are displayed in Tables B-25 and B-26. The following discussion highlights the resource relationships indicated by the benchmark analysis.

1. TIMBER HARVEST/ROADLESS AND WILDERNESS DESIGNATION

Much of the productive forest land which is also suitable for roadless or wilderness management is not economical or is only marginally suitable for timber management. Most of the tentatively suitable lands in the roadless inventory are very steep and costly to harvest and reforest. Decade 1 timber harvest schedule would not be affected at all if all roadless lands were wilderness but the long-term sustained yield would be reduced by 26.1 MMBF/year or 16.8 percent of the economic potential.

2. TIMBER HARVEST/LIVESTOCK FORAGE

Harvesting timber on gently sloping lands increases livestock forage on the Flathead. Maximizing forage would produce a grazing potential of about 7,040 AUM's, or a 50 percent increase from economic potential. A high level of timber harvest is compatible with the range resource, since the timber production associated with maximum range forage is higher than the cost efficient level of harvest shown by the PNV Benchmark.

3. TIMBER HARVEST/ELK FORAGE

The proper balance of winter elk forage and timber thermal cover must be maintained in order to produce the largest elk herds. Maximum elk forage is compatible with a high level of timber production. Maximizing elk forage would produce a higher timber harvest schedule than the cost of efficient level of the PNV Benchmark.

4. TIMBER HARVEST/THREATENED AND ENDANGERED SPECIES

Grizzly bear and gray wolf are the threatened and endangered species that inhabit the largest area of the Forest. Security is the most important area where timber harvest may conflict. Habitat potential is severely impacted when timber is maximized. Habitat index produced by the Maximum Timber Benchmark is 143 bears compared to the maximum potential 240 bears. The analysis shows there is a large area of compatibility for timber harvest and other resource production in the area near the recovered target of 207 bears. This area is between the 212-bear potential produced by minimum management and Maximum Wilderness Benchmarks to 184-bear potential produced by the PNV Benchmark.

5. RECREATION ROADLESS AND WILDERNESS DESIGNATION

Wilderness primitive recreation is inversely related to semiprimitive roadless recreation. As wilderness designations increase, the opportunity for semiprimitive motorized and semiprimitive nonmotorized use decreases.

6. ELK FORAGE/ROADLESS AND WILDERNESS DESIGNATION

There is minimal conflict between wilderness/roadless designation because most of the land suitable for winter range forage is not suitable for roadless or wilderness management. There are some local winter ranges on the Spotted Bear Ranger District which has potential conflicts, but these areas are a small percent of the total winter range.

TABLE B-25 Land Assignments by Management Emphasis for Benchmarks (Acres) - Flathead National Forest

		Management Emphasis*										
Benchmark	Min. Level	Disp. Rec.	Ret. VQO (Rd & NRd)	Deer Wtr Rge	Elk Wtr Rge	Rip. Wldlfe	Timber Road	Timber Not Rd.	Timber Riparian	Part. Ret Rd & NRd	Dev Rec	Gr. Bear
110MLV (Min. Level)	1229613	8902	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
110MP1	415381	-0-	4318	2071	38109	45992	712463	5050	-0-	503	-0-	-0-
110MP5	414878	-0-	1392	1386	17904	42402	715339	23992	-0-	567	-0-	-0-
110MP4	396914	-0-	1436	1386	18543	45992	755504	3489	-0-	503	-0-	-0-
110MP6	29993	342820	187	1386	22334	42402	767438	10733	-0-	567	-0-	-0-
110MP8	29878	341983	2175	1386	26709	41329	761218	10582	-0-	5887	-0-	-0-
110M9A	153258	277067	-0-	1386	18790	41252	714377	13942	-0-	-0-	447	-0-
110MP0 (Max PNV)	156467	283426	-0-	1386	19863	41252	702208	15470	-0-	-0-	447	-0-
110MT3 (Max Tbr.)	368295	-0-	-0-	4323	27707	5073	762826	5695	40919	8354	-0-	-0-
110MR3 (Max Rge.)	393114	-0-	5243	1794	26008	45992	730839	3489	-0-	17228	-0-	-0-
110MW5 (Max Wldlife)	397309	1136	2960	16869	40789	45992	701780	15974	-0-	958	-0-	-0-
110MWO (Max Wdrness)	45747	73798	-0-	898	6821	39637	549959	23327	-0-	-0-	447	-0-
110C5A (Cur. Dir.)	58086	374689	31447	13739	23419	6456	556408	7280	33281	80848	2234	35305

*Wilderness, Wild and Scenic Rivers, Jewel Basin, Big Mountain Ski Area, and Coram Experimental Forest do not change and are not displayed.

TABLE B-26 Estimated Decade 1 Total Resource Production by Benchmark With Projections for Subsequent Decades (Outputs Other than Nonperiodic are Average Annual Outputs) - Flathead National Forest

Output/Activity	Unit of Measure	110MLV	110MP1	110MP5	110MP4	110MP6	110MP8	110M9A	110MPO PNV	110MT3 Timber	110MR3 Range	110MW5 Wildlife	110MWO 9	110C5A 7
WILDERNESS MGMT.	m Acres	1069954	1069954	1069954	1069954	1069954	1069954	1069954	1069954	1069954	1069954	1069954	1069954	1069954
ELK-WINTER RANGE NONWILDERNESS Decade 1------------->	m Lbs. Forage	5032	3006	4542	4481	3967	4630	4500	4286	5182	4940	6290	3551	6774
2		4561	3220	4314	5299	3239	4932	4815	3962	5818	5650	7550	3278	7025
3		3910	2712	5729	6759	3539	5361	5440	4404	7983	7920	11280	3422	8123
4		3748	2587	5401	7142	3966	6268	5958	4852	7651	7560	12460	3970	8339
5		3525	2894	6729	6510	6447	7122	6012	6021	7243	7430	13640	4615	8101
LIVESTOCK GRAZING USE NONWILDERNESS Decade 1 ------------->	MAUM	-0-	4120	4120	4120	4120	4120	4120	4120	3850	4957	4721	4120	3770
2		-0-	4120	4120	4120	4120	4120	4120	4120	3850	8111	4014	4120	3850
3		-0-	4120	4120	4120	4120	4120	4120	4120	3850	11732	6713	4120	3850
4		-0-	4120	4120	4120	4120	4120	4120	4120	3850	10894	9167	4120	3850
5		-0-	4120	4120	4120	4120	4120	4120	4120	3850	6929	6970	4120	3850
TIMBER SUITABLE ACRES	Thousand Acres	-0-	836	751	767	790	780	732	723	836	-0-	-0-	722	578
LONG-TERM SUSTAINED YIELD	MMBF	-0-	152	146	188	154	158	153	155	201	184	188	129	165

TABLE B-26 (Continued)

Output/Activity	Unit of Measure	110MLV	110MP1	110MP5	110MP4	110MP6	110MP8	110M9A	110MPO PNV	110MT3 Timber	110MR3 Range	110MW5 Wildlife	110MWO 9	110C5A 7
PROGRAMED SALES OFFERED	MMBF													
Decade 1--------------->		-0-	45	16	53	16	101	101	103	171	132	62	103	132
2		-0-	29	8	140	12	101	111	102	171	132	107	97	122
3		-0-	167	157	174	156	101	133	130	171	168	175	106	167
4		-0-	49	93	174	95	101	159	151	178	168	175	125	143
5		-0-	620	629	174	632	471	191	183	190	168	175	146	161
ROAD CONSTR./ RECONSTR.	Miles	-0-	4596	4561	3611	4601	4419	3510	3379	3611	-0-	-0-	2258	3455
PRESENT VALUE BENEFITS (4$)	M$	173.2	791.3	740.4	768.2	1037.5	1090.1	1041.1	989.1	957.7	-0-	-0-	917.4	971.6
PRESENT VALUE COSTS (4$)	M$	73.2	357.7	337.2	380.4	344.1	407.1	396.4	383.6	586.2	-0-	-0-	331.1	438.9
PRESENT NET VALUE	M$	100.0	433.6	403.2	387.8	693.4	683.0	644.7	605.5	371.5	-0-	-0-	512.9	532.7

CHAPTER VII. FORMULATION OF ALTERNATIVES

A. INTRODUCTION

A Forest planning alternative is a mix of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives. To be viable (NFMA - 36 CRF 219.12f), the alternatives must:

1. Be distributed between the minimum resource potential and the maximum resource potential to reflect to the extent practicable the full range of major commodity and environmental resource uses and values that could be produced from the Forest. Alternatives shall reflect a range of resource outputs and expenditure levels.

2. Be formulated to facilitate analysis of opportunity costs and of resource use and environmental tradeoffs among alternatives and between benchmarks and alternatives.

3. Be formulated to facilitate evaluation of the effects on present net value, benefits, and costs of achieving various outputs and values that are not assigned monetary values, but that are provided at specified levels.

4. Provide different ways to address and respond to the major public issues, management concerns, and resource opportunities identified during the planning process.

5. Be formulated as reasonable alternatives, which may require a change in existing law or policy to implement, if necessary to address a major public issue, management concern, or resource opportunity identified during the planning process (40 CFR 1501.7, 1502.14(c)).

6. Have at least one alternative developed which responds to and incorporates the RPA Program tentative resource objectives for each Forest displayed in the Northern Regional Guide.

7. Have at least one alternative reflect the current level of goods and services provided by the unit and the most likely amount of goods and services expected to be provided in the future if current management direction continues. Pursuant to NEPA procedures, this alternative shall be deemed the "no action" alternative.

8. Represent to the extent practicable the most cost-efficient combination of management prescriptions examined that can meet the objectives established in the alternative.

9. State at least -

    a. The condition and uses that will result from long-term application of the alternative;

    b. The goods and services to be produced, the timing and flow of these resource outputs together with associated costs and benefits;

c. Resource management standards and guidelines; and

d. The purposes of the management direction proposed.

Formulating alternatives was planning action number five in the Forest planning process following the AMS (analysis of the management situation). During the analysis of the management situation, a determination was made of the ability of the Forest to supply goods and services. Maximum and minimum output levels were established. These levels form the range within which the alternatives were developed. Two specific alternatives are required. One alternative must be developed which responds to and incorporates the RPA (Resource Planning Act) program tentative resource objective. Another alternative was developed to reflect the current and expected level of goods and services produced should current management be continued (the "no-action" alternative). The process for formulating alternatives can best be explained in a series of steps.

1. Major public issues and management concerns were identified (see Appendix A).

2. Process criteria guiding the collection of data, analysis of the management situation, and formulation of alternatives were developed by the interdisciplinary team. These process criteria are documented in the planning records.

3. A comprehensive multi-resource data base was formed for the Forest and stored in a computer retrieval system.

4. Land analysis areas with similar physical and biological attributes were identified and mapped. The capability, suitability, and management opportunities of specific areas of the Forest were considered in this step. The Forest was stratified into 521 analysis areas.

5. A set of management prescriptions was prepared to represent a variety of possible ways and intensities to manage the Forest.

6. The 521 analysis areas identified in Step 4 were assigned management prescriptions. Some analysis areas were assigned only one prescription while others were assigned a variety of prescriptions that could be applied. Single prescription assignments limit the model's designation choices.

7. Resource outputs and the associated costs and dollar values that would result when a prescription was implemented were calculated and entered into the computer model FORPLAN.

8. Public consumption or public uses (demand) of certain resources was projected to establish need for changes from current management direction and to permit evaluation of the alternatives' responsiveness to public use levels.

9. A "Social and Economic Overview" that describes the social and economic characteristics of the local area was developed. This overview was used in the formulation of alternatives and in the analysis of the effects of the alternatives.

10. Supply potential's were determined using the FORPLAN computer model. Various assumptions, constraints, and objectives were used to establish benchmarks for supply potentials of each resource. Benchmarks were established for the minimum, maximum, and constraint resource levels and maximum present net value. Existing resource supply and projected demand were compared to supply potentials of each benchmark. Opportunities to resolve issues and concerns were identified for each resource by comparing existing and projected demand to potential production levels. These potentials, when compared to the Current Direction, indicate opportunities and/or need for change. This step concluded the analysis of the management situation - benchmark analysis.

11. Alternative objectives were established to provide a broad range of options for future management of the Forest. Selected benchmarks were used to define upper and lower limits for the production of each resource. These upper and lower limits outlined the decision space boundaries for the resources involved. The interdisciplinary team considered expected use, supply, potential (upper and lower limits), and evaluated public input to establish the range of alternatives within the decision spaces. Descriptions were written to define the resource management intent for each alternative.

12. The FORPLAN model was again used to estimate the outputs and costs for each alternative by reflecting the objective of the alternative through a given set of constraints.

13. The results of the FORPLAN analysis for each alternative were evaluated to assure conformance with laws, policies, and guidelines. Refinements were made to ensure that each alternative could be achieved.

Further information on the FORPLAN model is presented in Section IV of this appendix.

The interdisciplinary team incorporated cost-efficiency into the planning process. First, a comparative analysis was performed (see planning records) to identify the most cost-efficient prescriptions. For the timber resource, an additional analysis was done to identify the most cost-efficient level of management intensity on each timber prescription. Second, the interdisciplinary team developed different alternatives and identified the necessary constraints to address specific objectives, issues, and concerns. Third, prescriptions meeting the cost-efficiency test were combined with the necessary constraints and incorporated into FORPLAN to form different alternatives. Each alternative produced a different combination of priced and nonpriced outputs. The technical feasibility of each alternative is analyzed with FORPLAN. All constraints must be satisfied or an infeasibility will result. The methodology used to account for both categories in alternative formulation and evaluation is discussed in Section IV of this appendix.

B. COMMON CONSTRAINTS

In FORPLAN, the objectives and limitations of the alternative or benchmark were expressed as mathematical constraints which limit the solution within the desired bounds.

This section describes those constraints frequently used in the Flathead National Forest FORPLAN model during the development of alternatives. The second section displays the constraints used to model each alternative, including those general constraints discussed in the first section as well as those unique to each alternative. The PNV (Present Net Value) Benchmark is included because it formed the basis for the development of alternatives and is useful for comparison. More detailed information than that presented here is available in the Flathead National Forest planning records.

All alternatives and the PNV Benchmark used a "maximum PNV" objective function.

The constraints used in the Maximum PNV Benchmark formed the basis for constraints applied to all alternatives except current management (Alternative 7). The effects of some constraints applied early in this analysis process were effectively replaced by constraints developed and applied later (see Section VI). Common benchmark constraints were developed, examined, and tested to see how well they addressed their stated purpose. They also represent the most cost-efficient approach to meeting the intended purpose. These constraints were previously analyzed in Section VI, "Analysis Prior to Development of Alternatives." The benchmark constraints common to all alternatives were as follows:

1. NDY (NONDECLINING YIELD)

a. Constraint Description

This was modeled by using the SY-NDF link embedded in the FORPLAN program or by using sequential bounds on timber harvest volume with a zero lower bound.

b. Rationale

This constraint was used to ensure that all alternatives except departures met minimum legal requirements for base sale schedules (that the quantity of timber scheduled for sale and harvest was equal to or greater than the scheduled sale volume of the preceding decade). The Flathead National Forest always specified a less than or equal to long-term sustained yield when using this constraint to ensure that the scheduled sale volume was not greater than the long-term sustained yield capacity.

c. Tradeoff

A reduction in PNV of 15.4 million dollars or approximately 3 percent of potential.

2. EIC (ENDING INVENTORY CONSTRAINT)*

a. Constraint Description

This was embedded in the FORPLAN model.

b. Rationale

This constraint was used to ensure that alternatives met minimum legal requirements for a sustained yield of timber. This constraint requires that the total inventory of timber left at the end of the planning horizon equals or exceeds the timber volume that would occur in a regulated forest managed in accordance with management prescriptions selected for regenerated timber.

c. Tradeoff

Significant reduction in PNV of 119.7 million dollars. This constraint has the largest opportuntiy cost of any of the timber policy constraints.

3. VALUE CUTOFFS

a. Constraint Description

Dollar values assigned to transitory range and recreation visitor days associated with wilderness, dispersed recreation (including hunting and fishing), and developed recreation were developed and incorporated in FORPLAN as appended rows and columns. The values were appended to the FORPLAN generated matrix. The value cutoffs specified the amount to be valued in the "BOUNDS" data file element for the run, using the appended rows and columns. (Additional information is available in the Flathead National Forest planning records.)

b. Rationale

Value cutoffs were used to ensure that outputs are not valued when produced in excess of either the objective designated for the alternative or the maximum level that projections indicated would be used. By including assigned values in FORPLAN they could contribute to calculations of PNV and land designations.

c. Tradeoffs

None. These constraints ensure that excessive benefits are not calculated.

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* Every FORPLAN alternative run, with the exception of the departure analyses, was constrained by nondeclining flow, an ending inventory constraint, and long-term sustained yield capacity.

5. WINTER RANGE FORAGE

a. Constraint Description

Production objectives were expressed as a minimum forage volume (in pounds) to be produced in each time period.

b. Rationale

This contraint ensured that the amount of winter range forage available to support big-game animals is adequate to meet the objective of the alternative.

c. Tradeoff

No opportunity cost in benchmarks. These constraints do affect solutions of alternatives with objectives for winter forage production higher than that produced by the PNV Benchmark.

5. WINTER RANGE COVER

a. Constraint Description

Objectives were specified as timber inventory constraints applied to all lands suitable for timber production and designated as winter range management prescriptions. On whitetailed deer winter range managed as winter range, an inventory of trees 60 years of age or older must be maintained on 50 percent of the suitable timberland. On mule deer and elk winter range managed as winter range, an inventory of trees 60 years of age or older must be maintained on at least 30 percent of the suitable timberland.

b. Rationale

This constraint ensured that adequate thermal cover was maintained on suitable acres designated as big-game winter range prescriptions so that forage was fully utilized.

c. Tradeoff

No opportunity costs in benchmarks. The constraints do affect solutions of alternatives with objectives for winter range management on more acres than those assigned by the PNV Benchmark.

6. MANAGEMENT PRESCRIPTIONS

a. Constraint Description

By using management prescription constraints, management designations and/or intensity options were fixed.

b. Rationale

These constraints were used to ensure the geographic feasibility of the FORPLAN solution. They also ensured that the objectives for geographically specific areas were met. Spacial fitting constraints were determined by mapping "theoretical" first iterations of alternatives.

c. Tradeoff

A small reduction of PNV of about 1 percent (6.3 million dollars) in the PNV Benchmark. These constraints account for most of the PNV tradeoffs between alternatives as various patterns of land use other than those assigned by the PNV objective function are analyzed.

7. VQO (RETENTION VISUAL QUALITY OBJECTIVE)

a. Constraint Description

Constraints were applied to all lands designated as retention management prescriptions. This constraint restricted clearcut harvest to 20 percent or less of the total area designated as retention.

b. Rationale

This constraint ensured that timber harvest was not scheduled in any one decade in excess of that which could be harvested and still meet the retention VQO.

c. Tradeoff

No opportunity cost associated with the benchmarks. The constraints do affect the solution of alternatives that have objectives to manage more area for visual quality than the PNV Benchmark.

8. WATERSHED

a. Constraint Description

Constraints were generally specified for each Ranger District as maximum regeneration harvest areas by slope class for the first three decades.

b. Rationale

This constraint ensured that timber harvest was distributed among slope classes within minimal legal requirements. When unconstrained, the economic objective function caused FORPLAN to schedule all existing sawtimber for harvest in Decade 1 on certain analysis areas where timber values were highest and logging costs low (analysis areas with under 40 percent slopes). These same areas have had substantial harvest within the last two decades and minimum legal requirements would not be met by liquidating the remaining sawtimber in one decade while delaying harvest on steeper, higher-cost slopes. Current timber inventory data was used to determine maximum area available in each decade by slope class considering past harvest and recovery rates. This ensured that a 25 percent equivalent clearcut condition rule of thumb guideline would be met on each District. (See Flathead National Forest planning records for additional details.) No constraints were considered necessary after Decade 3 because age class distribution will have improved in drainages with contiguous sawtimber stands.

c. Tradeoff

Reduction in PNV of 32.9 million dollars.

9. WATERSHED AND SIZE OF OPENING TIMBER SCHEDULING

a. Constraint Description

These constraints were used for some analysis areas in Decade 1. These were specified by using "less than," "greater than," or "equal to" constraints on the total regeneration harvest area for Decade 1. Constraints were determined by mapping the harvest schedule produced by a "specially fit" iteration of FORPLAN for each alternative.

b. Rationale

This constraint ensured that the adverse effects of the geographic distribution of timber harvest in Decade 1 were minimized. The generalized watershed constraints discussed above improved but did not eliminate the problem of certain existing timber stands or aggregates of stands in local drainages being overscheduled in Decade 1 to maximize PNV. After the first "theoretical" land designation solution had been mapped that is subject only to the broad objectives of the alternative and generalized environmental constraints, the timber harvest schedule resulting from the second "spacially fit" iteration was analyzed on District maps. Constraints developed to minimize adverse environmental effects while still meeting harvest objectives were used for the final iteration of FORPLAN.

c. Tradeoff

None in benchmarks, but these vary by alternative and produce relatively small reductions in PNV.

C. DEVELOPMENT OF ALTERNATIVES

1. PNV BENCHMARK (FORPLAN RUN ID 110MPO)

FORPLAN iterations used in the development of this benchmark and their results are discussed in Chapter II. Iterations were made during the Analysis of the Management Situation for analysis purposes to define the opportunity costs associated with certain constraints used in alternative development. Only the final iteration is discussed here to avoid duplication.

a. Constraints

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: A ceiling on timber harvest was used for Decade 1. The ceiling was set at 780 MMBF/yr.
Rationale: The timber harvest ceiling was based on mill capacity within the zone of influence. It was designated to ensure that initial harvest of timber was not beyond industry's capability to utilize the timber.

(3) Constraint: A floor on timber harvest was used for all decades. The floor was set at 101 MMBF/yr.
Rationale: The timber harvest floor was based on 80 percent of current RPA targets. It was designed to ensure that unreasonable economic displacement did not occur as a result of the Forest's timber harvest schedule.

(4) Constraint: Sequential timber harvest flow constraints were used that permitted variation in timber harvest volumes of 20 percent up or down each decade.
Rationale: Sequential flow constraints ensured that harvest levels did not fluctuate from decade to decade beyond the ability of industry to make reasonable adjustments.

(5) Constraint: Value cutoffs for range and recreation values.
Rationale: The upper bound on valuation of these outputs was equal to projected levels of use.

(6) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(7) Constraint: Winter range cover objectives. (See Common Constraints).

(8) Constraint: Watershed (generalized constraints). (See Common Constraints).

(9) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting objectives.

2. ALTERNATIVE 1 (FORPLAN RUN ID 110C1C) CONSERVATIVE USE

a. Goals:

The Forest's primary objectives should encourage land uses that protect basic productivity and maintain the greatest number of future management options for the American people. Forests such as the Flathead with unique or scarce resources of national significance should place high priority on the protection of those resources. Extractive uses will continue to occur but must be carefully weighed against long-term social, economic, biological, and physical environmental costs. Nonextractive use of the Forest will be emphasized. This management direction best serves the interests of local communities and the Nation because it ensures continued resource reserves and maintains management options for future generations.

b. Criteria and Assumptions:

(1) Decade 1 timber harvest will be greater than or equal to 80 MMBF/yr.

(2) Capacity for 368 MRVD's of nonmotorized dispersed recreation will be provided.

(3) Wilderness will be managed at full-service level.

(4) Developed recreation will be full service at the heavy use areas, reduced service at other developed sites.

(5) Riparian areas will be managed for wildlife habitat at the high intensity level with no scheduled harvests.

(6) Nonwilderness permitted use will be less than 3,000 AUM/yr.

(7) Restrictive stipulations will be emphasized on more areas of mineral exploration and development.

(8) Public access will be reduced through extensive road closures.

(9) Habitat potential to provide for the grizzly recovery population target of 207 bears will be met or exceeded.

(10) Energy use will be conservative, both In-Service and externally by the public.

(11) Critical view areas will be protected.

(12) No expansion of Big Mountain Winter Sports Area will be accommodated.

(13) Wild and Scenic River and Jewel Basin Hiking Area will be managed at high intensity.

(14) No new wilderness will be recommended.

c. **Constraints:**

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining flow. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound on valuation of recreation outputs was equal to projected levels of use. A 15 percent reduction from current levels of range was (3,000 AUM's/year) was used as the upper bound on range.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraint.
Rationale: Visual quality objectives were fixed only on critical viewing areas using the management prescription constraint.

(6) Constraint: Winter range cover constraint. (See Common Constraints).

(7) Constraint: Big-game winter forage constraints. Minimum volume 78 MM lbs./decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 2,000 elk.

(8) Constraint: Management prescription constraints.
Rationale: Based on this alternative's objectives of providing nonmotorized recreation opportunities outside wilderness, dispersed recreation prescriptions were fixed on certain roadless areas.

(9) Constraint: Management prescription constraints.
Rationale: To meet the objectives of this alternative, all special areas and wildernesses were designated as high intensity prescriptions. Big Mountain was designated as a low intensity prescription that would not provide for expansion.

(10) Constraint: Management prescription constraints.
Rationale: To meet the objectives of this alternative, only high-use developed sites were designated as high intensity prescriptions, using management prescription constraints.

(11) Constraint: Watershed (generalized constraints). (See Common Constraints).

(12) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(13) Constraint: Timber harvest constraints were used for grizzly bear habitat; all Zone 1 grizzly habitat was fixed to grizzly bear management prescriptions.
Rationale: The objectives of this alternative was to achieve grizzly recovery targets. Constraints were developed to maintain cover objectives for grizzly habitat over time on the area designated as grizzly management prescriptions.

(14) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting objectives.

3. ALTERNATIVE 2 (FORPLAN RUN ID 110U2D) ACTIVE USE

a. Goals:

The public should have access to Forest products and services. Therefore, the Forest's primary objectives should ensure maximum multiple use of the land and resources while maintaining the land's basic productivity. Resources and the land are to be used and not wasted. The Forests need to contribute their share in the Nation's efforts to attain self-sufficiency in wood and energy-related resources. The Forests also need to recognize the recreation needs of the American people. Therefore, development of opportunities for the use of all resources will be the Flathead National Forest's objective. Intensive and comprehensive development of the Forest's resources will contribute to progress - not only for the Nation but for local communities as well.

b. **Criteria and Assumptions:**

(1) Decade 1 timber harvest will be greater than or equal to 115 MMBF/yr.

(2) Capacity for 368 MRVD's of nonmotorized dispersed recreation will be provided primarily on lands not suitable for timber management.

(3) Wilderness will be managed at full-service level.

(4) Developed recreation will be full service at the heavy use areas, reduced service at other developed sites.

(5) Riparian areas will be managed for timber and wildlife habitat at the high intensity level.

(6) Winter range forage production will achieve a sustained production of at least 10 million pounds/year by Decade 5.

(7) Nonwilderness permitted use will be less than 4,250 AUM/year.

(8) Restrictive stipulations will be minimized on areas of mineral exploration and development.

(9) Public access will be increased through extensive road construction and few closures.

(10) Habitat potential to provide for the grizzly recovery population target of 150 bears will be met or exceeded.

(11) Energy use will be increased, both In-Service and externally by the public.

(12) Critical view areas only will be protected.

(13) Expansion of Big Mountain Winter Sports Area will be accommodated.

(14) Wild and Scenic River and Jewel Basin Hiking Area will be managed at moderate intensity.

(15) No new wilderness will be recommended.

c. **Constraints:**

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound on valuation of recreation was equal to projected levels of use. The upper bound on range was set at 4,250 AUM's, a 20 percent increase over current levels of use.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraint).

(5) Constraint: Management prescription constraint.
Rationale: Visual quality objectives were fixed only on critical viewing areas using the management prescription constraint.

(6) Constraint: Winter range cover constraint. (See Common Constraint).

(7) Constraint: Big-game winter forage constraints. Minimum volume 100 MM lbs./decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 2,900 elk.

(8) Constraint: Management prescription constraints.
Rationale: To meet the objectives of this alternative, the wildernesses were assigned high intensity prescriptions in high-use areas. Big Mountain was assigned a high intensity prescription that allows expansion. Jewel Basin and the Wild and Scenic River were assigned moderate intensity prescriptions.

(9) Constraint: Management prescription constraints:
Rationale: To meet the objectives of this alternative, only high-use developed sites were designated as high intensity prescriptions using management prescription constraints.

(10) Constraint: Watershed (generalized constraints). (See Common Constraints).

(11) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(12) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting objectives.

4. ALTERNATIVE 3 (FORPLAN RUN ID 110T3D) TIMBER/RECREATION

a. Goals:

The National Forests' multiple-use management philosophy requires maintenance of basic land productivity, yet also allows coordination of Forest management activities with national and local land use trends in a manner consistent with the Forest's ability to supply products and services. The national need for recreational opportunities has greatly increased, with the focus on activities that are low in energy consumption. This national trend and a changing, growing, more recreation-oriented population have increased the importance of the recreation and tourism industry in this area. The national demand, however, for wood products will continue, and the wood products industry will continue to play an important role in the local economy. The Forest should respond to increasing national and local demands for outdoor recreation yet also recognize the importance of timber in the local economy.

b. Criteria and Assumptions:

(1) Decade 1 timber harvest will be greater than or equal to 100 MMBF/yr.

(2) Capacity for 400 MRVD's of nonmotorized dispersed recreation will be provided.

(3) Wilderness will be managed at full-service level.

(4) Developed recreation will be full service for all developed sites.

(5) Riparian areas will be managed for wildlife habitat at the high intensity level with no scheduled harvests on all fishery streams.

(6) Winter range forage production will achieve a sustained production of at least 11 million pounds/year by Decade 5.

(7) Nonwilderness permitted use will be at least 3,250 AUM/year.

(8) Restrictive stipulations will be moderate on areas of mineral exploration and development.

(9) Public access will be maintained near current levels with road closures at least seasonally on most new roads.

(10) Habitat potential to provide for the grizzly population target of 191 bears will be met or exceeded.

(11) Energy use will be moderate, both In-Service and externally by the public.

(12) Critical view areas will be protected plus 75 percent of recommended visual quality areas will be managed for the recommended VQO.

(13) Expansion of Big Mountain Winter Sports Area will be accommodated.

(14) Wild and Scenic River and Jewel Basin Hiking Area will be managed at high intensity.

(15) No new wilderness will be recommended.

c. **Constraints**

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound on valuation of recreation was equal to projected levels of use. The upper bound on range was set at 3,500 AUM's.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraint.
Rationale: Visual quality objectives were fixed on all areas with recommended visual quality objectives of retention and partial retention.

(6) Constraint: Winter range cover constraint. (See Common Constraints).

(7) Constraint: Big-game winter forage constraints. Minimum volume 110 MM lbs./decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 3,900 elk.

(8) Constraint: Management prescription constraints.
Rationale: To meet the objectives of this alternative, the wildernesses and special areas were assigned high intensity management prescriptions.

(9) Constraint: Management prescription constraints:
Rationale: To meet the objectives of this alternative, all developed sites were assigned high intensity prescriptions.

(10) Constraint: Watershed (generalized constraints). (See Common Constraints).

(11) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(12) Constraint: Total timber harvest volume constraints required a minimum total harvest volume for Decade 1 of 250.5 MM cu. ft.
Rationale: This constraint met the objectives of this alternative.

(13) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, grizzly bear management prescriptions were fixed on 33,000 acres of Zone 1 habitat.

(14) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting objectives.

5. ALTERNATIVE 4 (FORPLAN RUN ID 110B4C) BUSINESS

a. Goals:

The National Forest System was established to ensure effective and efficient use of National Forest System lands and resources. To achieve this goal, Flathead National Forest management should be as similar as possible to that of a business. Economic principles should receive highest priority in management decisions about the emphasis given to resources and specific management activities. Forest products and services that do not contribute monies to the Federal Treasury will receive limited management emphasis. Existing Federal laws, regulations, and policies will ensure that Forest management is within multiple-use guidelines. In addition, the productive capability of the land should be considered in determining resource management emphasis, with resources intensively managed only on the most suitable lands. Commodity resources will be managed and extracted where it is cost effective to do so. Businesslike management will benefit the public by increasing efficiency and minimizing management costs.

b. Criteria and Assumptions:

(1) Decade 1 timber harvest will be greater than or equal to 50 MMBF/yr.

(2) Capacity for 100 MRVD's of nonmotorized dispersed recreation will be provided.

(3) Wilderness will be managed at reduced-service level.

(4) Developed recreation will be full service at the heavy use areas, reduced service at other developed sites, and low use sites will be closed.

(5) Riparian areas will be managed for wildlife habitat at the high intensity level with no scheduled harvests.

(6) Winter range forage production will achieve a sustained production of 7.8 million pounds/year by Decade 5.

(7) Nonwilderness permitted use will be at least 3,800 AUM/yr.

(8) Restrictive stipulations will be minimized on areas of mineral exploration and development.

(9) Public access will be increased through road construction and few closures.

(10) Habitat potential to provide for the grizzly population target of 150 bears will be met or exceeded.

(11) Energy use will be conservative In-Service.

(12) Critical view areas only will be protected.

(13) Expansion of Big Mountain Winter Sports Area will be accommodated.

(14) Wild and Scenic River and Jewel Basin Hiking Area will be managed at low intensity.

(15) No new wilderness will be recommended.

c. Constraints:

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound on valuation of recreation was equal to projected levels of use. The upper bound on range was set at 3,930 AUM's which is equal to current levels of use.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraint.
Rationale: Visual quality objectives were fixed only on the critical viewing areas using the management prescription constraints.

(6) Constraint: Winter range cover constraint. (See Common Constraints).

(7) Constraint: Big-game winter forage constraints. Minimum volume 78 MM lbs./decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 2,000 elk.

(8) Constraint: Management prescription constraints.
Rationale: To meet the objectives of this alternative, the wildernesses and all special areas, with the exception of Big Mountain, were designated as low intensity prescriptions.

(9) Constraint: Management prescription constraints.
Rationale: To meet the objectives of this alternative, the high-use developed sites were designated as high intensity; others were closed.

(10) Constraint: Watershed (generalized constraints). (See Common Constraints).

(11) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(12) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting objectives.

6. ALTERNATIVE 5 (FORPLAN RUN ID 110A5A) NONMARKET

a. Goals:

The National Forests should be viewed as unique public lands with a public trust to preserve that uniqueness as well as a source of commodities for commercial use. Economic sense should be used when producing commodities. More importantly, management should be based on the conservation and maintenance of soil, air, and water. Because mankind is only beginning to understand the interrelationships of our natural resources and the effects which they have upon one another, "careful caretaking" must be the watchwords of Forest managers. One resource value should be unwittingly enhanced to the detriment of other resource values. All renewable resources of the Forest, including fish, wildlife, watershed, timber, recreation, and wildlands must be managed on a sustained-yield basis.

b. Criteria and Assumptions:

(1) Decade 1 timber harvest will be greater than or equal to 80 MMBF/yr.

(2) Capacity for 375 MRVD's of nonmotorized dispersed recreation will be provided. High quality areas will be assigned to dispersed recreation plus all low productivity (less than 50 cubic feet/acre/year) timberlands.

(3) Wilderness will be managed at full-service level.

(4) Developed recreation will be full service.

(5) Riparian areas will be managed for wildlife habitat at the high intensity level with no scheduled harvests.

(6) All areas suitable for big-game winter range will be managed as winter range.

(7) Nonwilderness permitted use will be less than 3,000 AUM/yr.

(8) Restrictive stipulations will be emphasized on more areas of mineral exploration and development.

(9) Public access will be reduced through road closures.

(10) Habitat potential to provide for the grizzly population target of 190 bears will be met or exceeded.

(11) Energy use will be conservative, both In-Service and externally by the public.

(12) Critical view areas will be protected, plus about 50 percent of the other recommended visual quality areas.

(13) No expansion of Big Mountain Winter Sports Area will be accommodated.

(14) Wild and Scenic River and Jewel Basin Hiking Area will be managed at high intensity.

(15) No new wilderness will be recommended.

c. **Constraints:**

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound for recreation valuation was equal to projected levels of use. The upper bound on range was set at 3,000 AUM's.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraints.
Rationale: Visual quality objective prescriptions were fixed on about 50 percent of the areas with recommended VQO's of retention or partial retention.

(6) Constraint: Winter range cover constraints. (See Common Constraints).

(7) Constraint: Management prescription constraints.
Rationale: The big-game winter range management prescription was fixed at high intensity on all suitable winter ranges to meet the alternative's objectives.

(8) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, all wildernesses and special areas were designated as high intensity prescriptions.

(9) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, dispersed recreation or amenity value management prescriptions were applied to high quality existing roadless areas.

(10) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, all developed sites with site damage or high levels of use were assigned high intensity prescriptions.

(11) Constraint: Watershed (generalized constraints). (See Common Constraints).

(12) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(13) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting objectives.

7. ALTERNATIVE 6 (FORPLAN RUN ID 110C6A) HIGH MARKET

a. Goals:

The National Forests should explore the compatibility among resource uses, such as timber, recreation, and range. Management designed to serve single-use amenity objectives should receive less emphasis than commodity management that focuses on making direct economic contributions to the Nation's economy and Federal Government. Resources should be wisely used to meet public needs. Resource preservation and withdrawals from development activities will be made where justified by the relative values involved.

b. **Criteria and Assumptions:**

(1) Decade 1 timber harvest will be greater than or equal to 135 MMBF/yr.

(2) Capacity for 350 MRVD's of nonmotorized dispersed recreation will be provided.

(3) Wilderness will be managed at full-service level.

(4) Developed recreation will be full service.

(5) Riparian areas will be managed for timber wildlife habitat at the high intensity level with no scheduled harvests.

(6) Big-game winter range production will be a by product of cost effective timber harvests.

(7) Nonwilderness permitted use will be based on production forage. All forage should be utilized.

(8) Restrictive stipulations will be minimized on areas of mineral exploration and development.

(9) Public access will increase through extensive roading with moderate closures.

(10) Habitat potential to provide for the grizzly recovery population target of 150 bears will be met or exceeded.

(11) Energy use will be high, both In-Service and externally by the public.

(12) Expansion of Big Mountain Winter Sports Area will be accommodated.

(13) Wild and Scenic River and Jewel Basin Hiking Area will be managed at high intensity.

(14) No new wilderness will be recommended.

c. **Constraints:**

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound on recreation valuation was projected levels of use. A nonbinding bound was used on range to ensure that all potential output was valued.

(4) Constraint: Timber harvest constraints were used to ensure a minimum total volume for Decade 1 of 337.5 MM cu. ft.

Rationale: This constraint was used to meet the objectives of the alternative.

(5) Constraint: Watershed (generalized constraints). (See Common Constraints).

(6) Constraint: Management prescription constraints.

Rationale: These constraints were used to accomplish spacial fitting objectives.

8. ALTERNATIVE 7 (FORPLAN RUN ID 110CR5) CURRENT DIRECTION AND 1980 RPA

a. Goals:

Current Direction (Alternative 7) continues the management direction provided by the Ranger District Multiple-Use Plans and the Unit Plans developed for portions of the Forest. Since these plans were put into effect, legal changes have altered management direction in the following ways:

- The Great Bear Wilderness was added to the National Wilderness Preservation System.
- The South, Middle, and North Forks of the Flathead River were designated as part of the Wild and Scenic River System.
- Some land adjustments have been made to meet multiple-use land management objectives.
- Timber utilization standards are specified by the Northern Regional Guide.

In addition, the rapidly growing body of knowledge upon which management is based has made it possible to determine land capability more accurately.

b. Criteria and Assumptions:

(1) Decade 1 timber harvest will be greater than or equal to 123 MMBF/year.

(2) All other resource and economic outputs will be a product of land use assignments based on current Land Use and Multiple-Use Plans.

c. Constraints:

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2)	**Constraint:**	**Nondeclining yield. (See Common Constraints).**
(3)	Constraint:	**A timber harvest constraint was used to ensure a minimum total volume in Decade 1 of 307.5 MM cu. ft.**
	Rationale:	This timber harvest constraint reflects the allowable sale quantity of the 1969 Flathead Timber Management Plan, as it has been adjusted for land classification changes.
(4)	Constraint:	Management prescription constraint.
	Rationale:	Prescription constraints were used to fix management emphasis and intensity for each acre. This ensures that Current Direction is modeled as it exists in both land designation and management intensity.
(5)	Constraint:	Retention visual quality objective constraint. (See Common Constraints).
(6)	Constraint:	Winter range cover constraint. (See Common Constraints).

9. ALTERNATIVE 8 (FORPLAN RUN ID 110P8B)

a. Goals:

The National Forests' multiple-use management philosophy requires maintenance of basic land productivity, yet also allows coordination of Forest management activities with national and local land use trends in a manner consistent with the Forest's ability to supply products and services. The national need for recreational opportunities has greatly increased, with the focus on activities that are low in energy consumption. This national trend and a changing, growing, more recreation-oriented population have increased the importance of recreation and tourism industry in this area. The national demand, however, for wood products will continue, and the wood products industry will continue to play an important role in the local economy. The Forest should respond to increasing national and local demands for outdoor recreation yet also recognize the importance of timber in the local economy.

b. Criteria and Assumptions:

(1) Decade 1 timber harvest will be greater than or equal to 100 MMBF/yr.

(2) Capacity for 368 MRVD's of nonmotorized dispersed recreation will be provided.

(3) Wilderness will be managed at full-service level.

(4) Developed recreation will be full service.

(5) Riparian areas will be managed for wildlife habitat at the high intensity level with no scheduled harvests on all important fishery streams.

(6) Big-game winter range forage will achieve a sustained production of 11 million pounds/year by Decade 5.

(7) Nonwilderness permitted use will be less than 3,500 AUM/yr.

(8) Restrictive stipulations will be moderate on areas of mineral exploration and development.

(9) Public access will be maintained near current levels.

(10) Habitat potential to provide for the grizzly population target of 200 bears will be met or exceeded.

(11) Energy use will be moderate, both In-Service and externally by the public.

(12) Critical view areas will be protected, plus less than 50 percent of recommended levels. The VQO objective will be reduced on some areas.

(13) Expansion of Big Mountain Winter Sports Area will be accommodated.

(14) Wild and Scenic River and Jewel Basin Hiking Area will be managed at high intensity.

(15) No new wilderness will be recommended.

c. **Constraints:**

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound on valuation of recreation was equal to projected levels of use. The upper bound on range was set 3,500 AUM's.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraints.
Rationale: Visual quality objective prescriptions were fixed on about 50 percent of the areas with recommended visual quality objectives of retention or partial retention.

(6)	Constraint:	Winter range cover constraint. (See Common Constraints).
(7)	Constraint:	Big-game winter forage constraints. Minimum volume 110 MM lbs./decade for Decades 5-15.
	Rationale:	Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 3,900 elk.
(8)	Constraint:	Management prescription constraint.
	Rationale:	To meet the objectives of this alternative, the wildernesses and special areas were assigned high intensity management prescriptions.
(9)	Constraint:	Management prescription constraint.
	Rationale:	To meet the objectives of the alternative, all developed sites were assigned high intensity prescriptions.
(10)	Constraint:	Watershed (generalized constraints). (See Common Constraints).
(11)	Constraint:	Watershed and size of opening timber scheduling constraints. (See Common Constraints).
(12)	Constraint:	Total timber harvest volume constraints required a minimum total harvest for Decade 1 of 250.5 MM cu. ft.
	Rationale:	This constraint met the objectives of this alternative.
(13)	Constraint:	Grizzly bear designation fixed on portions of Zone 1 habitat.
	Rationale:	To meet the objectives of this alternative, grizzly bear management prescriptions were fixed on 94,000 acres of Zone 1 habitat.
(14)	Constraint:	Timber harvest constraints.
	Rationale:	These constraints were applied to grizzly bear prescriptions to ensure forage/cover ratios and grizzly habitat objectives are met on suitable lands designated as grizzly bear prescriptions.
(15)	Constraint:	Management prescription constraints.
	Rationale:	These constraints were used to accomplish spacial fitting objectives.

10. ALTERNATIVE 9 (FORPLAN RUN ID 110MWO) MAXIMUM WILDERNESS

a. Goals:

Alternative 9 emphasizes the wilderness resource on the Flathead National Forest. All 495,000 acres of roadless area are designated as wilderness. Other resources are managed in a cost-effective manner. This alternative was studied in detail as a point of comparison with the other alternatives, and to display the consequences of all roadless areas designated as a wilderness designation.

b. Criteria and Assumptions:

(1) Decade 1 timber harvest will be greater than or equal to 101 MMBF/year.

(2) Wilderness will be managed at full-service level.

(3) Developed recreation will be full service at the heavy use areas, reduced service at other developed sites.

(4) All other land use assignments and resulting resource outputs will be a result of the economic objective function.

c. Constraints:

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: A ceiling on timber harvest was used for Decade 1. The ceiling was set at 780 MMBF/yr.

Rationale: The timber harvest ceiling was based on mill capacity within the zone of influence. It was designated to ensure that initial harvest of timber was not beyond industry's capability to utilize the timber.

(3) Constraint: A floor on timber harvest was used for all decades. The floor was set at 101 MMBF/yr.

Rationale: The timber harvest floor was based on 80 percent of current RPA targets. It was designed to ensure that unreasonable economic displacement did not occur as a result of the Forest's timber harvest schedule.

(4) Constraint: Sequential timber harvest flow constraints were used that permitted variation in timber harvest volumes of 20 percent up or down each decade.

Rationale: Sequential flow constraints ensured that harvest levels did not fluctuate from decade to decade beyond the ability of industry to make reasonable adjustments.

(5) Constraint: Value cutoffs for range and recreation values.
Rationale: The upper bound on valuation of these outputs was equal to projected levels of use.

(6) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(7) Constraint: Winter range cover objectives. (See Common Constraints).

(8) Constraint: Watershed (generalized constraints). (See Common Constraints).

(9) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting objectives and to model all the current roadless inventory as wilderness as an objective of the alternative.

11. ALTERNATIVE 10 (FORPLAN RUN ID 110AW5)

a. Goals:

The National Forests should be viewed as unique public lands with a public trust to preserve that uniqueness as well as a source of commodities for commercial use. Economic sense should be used when producing commodities. More important, management should be based on the conservation and maintenance of soil, air, and water. Because mankind is only beginning to understand the interrelationships of our natural resources and the effects which they have upon one another, "careful caretaking" must be the watchwords of Forest managers. One resource value should not be unwittingly enhanced to the detriment of other resource values. All renewable resources of the Forest, including fish, wildlife, watershed, timber, recreation, and wildlands must be managed on a sustained yield basis.

Wilderness will be recommended for pristine areas where roadless and wildlife values are high. Timber production and resource extraction are concentrated in other portions of the Forest because of the importance of the timber industry in the local economy.

Those areas managed as wilderness are the Swan Range and the north end of Glacier View Ranger District. In addition, the Le Beau area of the Tally Lake Ranger District and the roadless portions of the Spotted Bear Ranger District are managed for primitive recreation, water protection, and wildlife. This alternative provides a large amount of acreage for primitive recreation, old growth, and nongame species habitat.

b. **Criteria and Assumptions:**

(1) Decade 1 timber harvest will be greater than or equal to 80 MMBF/yr.

(2) Wilderness will be managed at full-service level.

(3) Developed recreation will be full service.

(4) Riparian areas will be managed for wildlife habitat at the high intensity level with no scheduled harvests.

(5) All areas suitable for winter range will be managed as winter range.

(6) Nonwilderness permitted use will be less than 3,000 AUM/yr.

(7) Restrictive stipulations will be emphasized on more areas of mineral exploration and development.

(8) Public access will be reduced through extensive road closures.

(9) Habitat potential to provide for the grizzly recovery population target of 195 bears will be met or exceeded.

(10) Energy use will be conservative, both In-Service and externally by the public.

(11) Critical view areas will be protected.

(12) No expansion of Big Mountain Winter Sports Area will be accommodated.

(13) Wild and Scenic River and Jewel Basin Hiking Area will be managed at high intensity.

(14) No new wilderness will be recommended.

c. **Constraints:**

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound for recreation valuation was equal to projected levels fo use. The upper bound on range was set at 3,000 AUM's.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraints.
Rationale: Visual quality objective prescriptions were fixed on about 50 percent of the areas with recommended VQO's of retention or partial retention.

(6) Constraint: Winter range cover constraints. (See Common Constraints).

(7) Constraint: Management prescription constraint.
Rationale: The big-game winter range management prescription was fixed at high intensity on all suitable winter ranges to meet the alternative's objectives.

(8) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, all wildernesses and special areas were designated as high intensity prescriptions.

(9) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, dispersed recreation or amenity value management prescriptions were applied to high quality existing roadless areas. Additional wilderness approximating the areas recommended by the Montana Wilderness Association's "Alternative W" was designated as high intensity.

(10) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, all developed sites with site damage or high levels of use were assigned high itensity prescriptions.

(11) Constraint: Watershed (generalized constraints). (See Common Constraints).

(12) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(13) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting objectives.

12. ALTERNATIVE 11 (FORPLAN RUN ID 110PW1)

a. Goals:

The National Forests' multiple-use management philosophy requires maintenance of basic land productivity, yet also allows coordination of Forest management activities with national and local land use trends in a manner consistent with the Forest's ability to supply products and services. The national need for recreational opportunities has greatly increased, with the focus on activities that are low in energy consumptions. This national trend and a changing, growing, more recreation-oriented population have increased the importance of the recreation and tourism industry in this area. The national demand, however, for wood products will continue, and the wood products industry will continue to play an importance role in the local economy. The Forest should respond to increasing national and local demands for outdoor recreation yet also recognize the importance of timber in the local economy.

Alternative 11 has the same objectives as Alternative 8 along with an additional objective for adding to the Bob Marshall Wilderness. The ID Team recommended that additions to the Bob Marshall Wilderness should include the roadless area portions with the highest quality wilderness attributes and the most manageable boundaries.

The recommended wilderness additions include 5,187 acres in the Limestone Cave area of the East South Fork Roadless Area and 43,667 acres in the Swan Front area.

b. Criteria and Assumptions:

(1) Decade 1 timber harvest will be greater than or equal to 100 MMBF/yr.

(2) Capacity for 300 MRVD's of nonmotorized dispersed recreation will be provided.

(3) Wilderness will be managed at full-service level.

(4) Developed recreation will be full service.

(5) Riparian areas will be managed for wildlife habitat at the high intensity level with no scheduled harvests on all important fishery streams.

(6) Nonwilderness permitted use will be less than 3,500 AUM/yr.

(7) Use of restrictive stipulations will be moderate on areas of mineral exploration and development.

(8) Public access will be maintained near current levels.

(9) Habitat potential to provide for the grizzly recovery population target of 200 bears will be met or exceeded.

(10) Energy use will be moderate, both In-Service and externally by the public.

(11) Critical view areas will be protected, but VQO will be reduced in high cost areas.

(12) Expansion of Big Mountain Winter Sports Area will be accommodated.

(13) Wild and Scenic River and Jewel Basin Hiking Area will be managed at high intensity.

c. **Constraints:**

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value Cutoffs.
Rationale: The upper bound on valuation of recreation was equal to projected levels of use. The upper bound on range was set 3,500 AUM's.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraints.
Rationale: Visual quality objective prescriptions were fixed on about 50 percent of the areas with recommended visual quality objectives of retention or partial retention.

(6) Constraint: Winter range cover constraint. (See Common Constraints).

(7) Constraint: Big-game winter forage constraints. Minimum volume 110 MM lbs./decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 3,000 elk.

(8) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, the wildernesses and special areas were assigned high intensity management prescriptions.

(9) Constraint: Management prescription constraint.
Rationale: To meet the objectives of the alternative, all developed sites were assigned high intensity prescriptions.

(10) Constraint: Watershed (generalized constraints). (See Common Constraints).

(11) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(12) Constraint: Total timber harvest volume constraints required a minimum total harvest for Decade 1 of 250.5 MM cu. ft.
Rationale: This constraint met the objectives of this alternative.

(13) Constraint: Management prescription constraint. (See Common Constraints).

(14) Constraint: Grizzly bear designation fixed on portions of Zone 1 habitat.
Rationale: To meet the objectives of this alternative, grizzly bear management prescriptions were fixed on 94,000 acres of Zone 1 habitat.

(15) Constraint: Timber harvest constraints.
Rationale: These constraints were applied to grizzly bear prescriptions to ensure forage/cover ratios and grizzly habitat objectives are met on suitable lands designated as grizzly bear prescriptions.

(16) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting and wilderness addition objectives amounting to 48,800 acres of Bob Marshall Wilderness boundary adjustments in the Swan Front and East South Fork Flathead roadless areas.

13. ALTERNATIVE 12 (FORPLAN RUN ID 110PW2)

a. Goals:

The National Forests' multiple-use management philosophy requires maintenance of basic land productivity, yet also allows coordination of Forest management activities with national and local land use trends in a manner consistent with the Forest's ability to supply products and services. The national need for recreational opportunities has greatly increased, with the focus on activities that are low in energy consumption. This national trend and a changing, growing, more recreation-oriented population have increased the importance of the recreation and tourism industry in this area. The national demand, however, for wood products will continue, and the wood products industry will continue to play an important role in the local economy. The Forest should respond to increasing national and local demands for outdoor recreation yet also recognize the importance of timber in the local economy.

Alternative 12 has the same objectives as Alternative 8 along with an additional objective of adding to the existing Bob Marshall Wilderness. The ID Team recommended that wilderness additions should include the roadless area portions with the highest quality wilderness attributes. The recommended wilderness addition includes an expanded Swan Front addition.

b. Constraints:

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound on valuation of recreation was equal to projected levels of use. The upper bound on range was set 3,500 AUM's.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraints.
Rationale: Visual quality objective prescriptions were fixed on about 50 percent of the areas with recommended visual quality objectives of retention or partial retention.

(6) Constraint: Winter range cover constraint. (See Common Constraints).

(7) Constraint: Big-game winter forage constraints. Minimum volume 110 MM lbs./decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 3,900 elk.

(8) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, the wildernesses and special areas were assigned high intensity management prescriptions.

(9) Constraint: Management prescription constraint.
Rationale: To meet the objectives of the alternative, all developed sites were assigned high intensity prescriptions.

(10) Constraint: Watershed (generalized constraints). (See Common Constraints).

(11) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(12) Constraint: Total timber harvest volume constraints required a minimum total harvest for Decade 1 of 250.5 MM cu. ft.
Rationale: This constraint met the objectives of this alternative.

(13) Constraint: Management prescription constraint. (See Common Constraints).

(14) Constraint:	Grizzly bear designation fixed on portions of Zone 1 habitat.
Rationale:	To meet the objectives of this alternative, grizzly bear management prescriptions were fixed on 94,000 acres of Zone 1 habitat.
(15) Constraint:	Timber harvest constraints.
Rationale:	Thse constraints were applied to grizzly bear prescriptions to ensure forage/cover ratios and grizzly habitat objectives are met on suitable lands designated as grizzly bear prescriptions.
(16) Constraint:	Management prescription constraints.
Rationale:	These constraints were used to accomplish spacial fitting and wilderness addition objectives amounting to 82,500 acres of Bob Marshall Wilderness boundary adjustments in the Swan Front roadless area.

14. ALTERNATIVE 13 (FORPLAN RUN ID 110PW3)

a. Goals:

The National Forests' multiple-use management philosophy requires maintenance of basic land productivity, yet also allows coordination of Forest management activities with national and local land use trends in a manner consistent with the Forest's ability to supply products and services. The national need for recreational opportunities has greatly increased, with the focus on activities tht are low in energy consumption. This national trend and a changing, growing, more recreation-oriented population have increased the importance of the recreation and tourism industry in this area. The national demand, however, for woods products will continue, and the woods products industry will continue to play an important role in the local economy. The Forest should respond to increasing national and local demands for outdoor recreation yet also recognize the importance of timber in the local economy.

Alternative 13 has the same objectives as Alternative 8 along with an additional objective of adding substantial wilderness close to population centers. The ID Team determined that wilderness additions would include the roadless areas with the highest quality wilderness attributes in the Swan Range.

The recommended wilderness addition includes the Swan Front and Swan Crest. Commodity and noncommodity objectives remain the same as Alternative 12.

b. Constraitns:

(1) Constraint:	Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: This upper bound on valuation of recreation was equal to projected levels of use. The upper bound on range was set 3,500 AUM's.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraints.
Rationale: Visual quality objective prescriptions were fixed on about 50 percent of the areas with recommended visual quality objectives of retention or partial retention.

(6) Constraint: Winter range cover constraint. (See Common Constraints).

(7) Constraint: Big-game winter forage constraints. Minimum volume 110 MM lbs./decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 3,900 elk.

(8) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, the wildernesses and special areas were assigned high intensity management prescriptions.

(9) Constraint: Management prescription constraint.
Rationale: To meet the objectives of the alternative, all developed sites were assigned high intensity prescriptions.

(10) Constraint: Watershed (generalized constraints). (See Common Constraints).

(11) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(12) Constraint: Total timber harvest volume constraints required a minimum total harvest for Decade 1 of 250.5 MM cu. ft.
Rationale: This constraint met the objectives of this alternative.

(13) Constraint: Management prescription constraint. (See Common Constraints).

(14) Constraint:	Grizzly bear designation fixed on portions of Zone 1 habitat.
Rationale:	To meet the objectives of this alternative, grizzly bear management prescriptions were fixed on 94,000 acres of Zone 1 habitat.
(15) Constraint:	Timber harvest constraints.
Rationale:	These constraints were applied to grizzly bear prescriptions to ensure forage/cover ratios and grizzly habitat objectives are met on suitable lands designated as grizzly bear prescriptions.
(16) Constraint:	Management prescription constraints.
Rationale:	These constraints were used to accomplish spacial fitting and wilderness addition objectives amounting to 143,000 acres of Bob Marshall Wilderness boundary adjustments in the Swan Front and Swan Crest roadless areas.

15. ALTERNATIVE 14 (FORPLAN RUN ID 110PW4)

a. Goals:

The National Forests' multiple-use management philosophy requires maintenance of basic land productivity, yet also allows coordination of Forest management activities with national and local land use trends in a manner consistent with the Forest's ability to supply products and services. The national need for recreational opportunities has greatly increased, with the focus on activities that are low in energy consumption. This national trend and a changing, growing, more recreation-oriented population have increased the importance of the recreation and tourism industry in this area. The national demand, however, for wood products will continue, and the wood products industry will continue to play an important role in the local economy. The Forest should respond to increasing national and local demands for outdoor recreation yet also recognize the importance of timber in the local economy.

Alternative 14 has the same objectives as Alternative 8 along with an additional objective of adding a significant amount of wilderness while maintaining or increasing commodity and other outputs on the nonwilderness portion of the Forest. The ID Team recommended that wilderness additions should include the roadless areas with the highest quality wilderness attributes and should include more than just additions to the Bob Marshall-Great Bear-Scapegoat Complex on the Flathead National Forest. The recommended wilderness additions resulting from the objectives closely approximates the areas recommended by the Montana Wilderness Association's "Alternative W."

Commodity and noncommodity objectives remain the same as Alternative 8.

b. Constraints:

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound on valuation of recreation was equal to projected levels of use. The upper bound on range was set 3,500 AUM's.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraints.
Rationale: Visual quality objective prescriptions were fixed on about 50 percent of the areas with recommended visual quality objectives of retention or partial retention.

(6) Constraint: Winter range cover constraint. (See Common Constraints).

(7) Constraint: Big-game winter forage constraints. Minimum volume 110 MM lbs./decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 3,900 elk.

(8) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, the wildernesses and special areas were assigned high intensity management prescriptions.

(9) Constraint: Management prescription constraint.
Rationale: To meet the objectives of the alternative, all developed sites were assigned high intensity prescriptions.

(10) Constraint: Watershed (generalized constraints). (See Common Constraints).

(11) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(12) Constraint: Total timber harvest volume constraints required a minimum total harvest for Decade 1 of 250.5 MM cu. ft.
Rationale: This constraint met the objectives of this alternative.

(13) Constraint: Management prescription constraint. (See Common Constraints).

(14) Constraint: Grizzly bear designation fixed on portions of Zone 1 habitat.
Rationale: To meet the objectives of this alternative, grizzly bear management prescriptions were fixed on 94,000 acres of Zone 1 habitat.

(15) Constraint: Timber harvest constraints.
Rationale: These constraints were applied to grizzly bear prescriptions to ensure forage/cover ratios and grizzly habitat objectives are met on suitable lands designated as grizzly bear prescriptions.

(16) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting and wilderness addition objectives amounting to 196,700 acres in the Swan Front, Swan Crest, Mt. Hefty, Tuchuck, and Mt. Thompson Seton roadless areas.

16. ALTERNATIVE 15 (FORPLAN RUN ID 110PW5)

a. Goals:

The National Forests' multiple-use management philosophy requires maintenance of basic land productivity, yet also allows coordination of Forest management activities with national and local land use trends in a manner consistent with the Forest's ability to supply products and services. The national need for recreational opportunities has greatly increased, with the focus on activities that are low in energy consumption. This national trend and a changing, growing, more recreation-oriented population have increased the importance of the recreation and tourism industry in this area. The national demand, however, for wood products will continue, and the wood products industry will continue to play an important role in the local economy. The Forest should respond to increasing national and local demands for outdoor recreation yet also recognize the importance of timber in the local economy.

Alternative 15 has the same objectives as Alternative 8 along with an additional objective of adding substantial wilderness acres to the National Wilderness Preservation System. The ID Team recommended that wilderness additions should include the roadless areas with the highest quality wilderness attributes and should include additions to the Bob Marshall-Great Bear-Scapegoat Complex in several drainages of the Flathead National Forest plus an expanded north end wilderness.

b. Constraints:

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound on valuation of recreation was equal to projected levels of use. The upper bound on range was set 3,500 AUM's.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraints.
Rationale: Visual quality objective prescriptions were fixed on about 50 percent of the areas with recommended visual quality objectives of retention or partial retention.

(6) Constraint: Winter range cover constraint. (See Common Constraints).

(7) Constraint: Big-game winter forage constraints. Minimum volume 110 MM lbs./decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 3,900 elk.

(8) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, the wildernesses and special areas were assigned high intensity management prescriptions.

(9) Constraint: Management prescription constraint.
Rationale: To meet the objectives of the alternative, all developed sites were assigned high intensity prescriptions.

(10) Constraint: Watershed (generalized constraints). (See Commmon Constraints).

(11) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(12) Constraint: Total timber harvest volume constraints required a minimum total harvest for Decade 1 of 250.5 MM cu. ft.
Rationale: This constraint met the objectives of this alternative.

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(13) Constraint: Management prescription constraint. (See Common Constraints).

(14) Constraint: Grizzly bear designation fixed on portions of Zone 1 habitat.
Rationale: To meet the objectives of this alternative, grizzly bear management prescriptions were fixed on 94,000 acres of Zone 1 habitat.

(15) Constraint: Timber harvest constraints.
Rationale: These constraints were applied to grizzly bear prescriptions to ensure forage/cover ratios and grizzly habitat objectives are met on suitable lands designated as grizzly bear prescriptions.

(16) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting and wilderness addition objectives amounting to 260,205 acres in the Swan Front, Swan Crest, Mt. Hefty, Tuchuck, and Thompson Seton, Young-Nasakoin, Slippery Bill Mountain area of the Middle Fork Flathead, and Spotted Bear Mountain-Dean Ridge area of the East South Fork Flathead roadless areas.

17. ALTERNATIVE 16 (FORPLAN RUN ID 110CW1)

a. Goals:

The National Forest System was established to ensure that the National Forest System lands and resources are used in multiple ways, yet are used conservatively. The Forest's primary management objectives should encourage land uses that protect basic productivity and maintain the greatest number of future management options for the American people. Forests such as the Flathead National Forest with unique or scarce resources of national significance should place high priority on the protection of those resources. Extractive uses will continue to occur but must be carefully weighed against long-term social, economic, biological, and physical environmental costs. Nonextractive use of the Forest will be emphasized. This management direction best serves the interests of local communities and the Nation because it ensures continued resource reserves and maintains management options for future generations.

This alternative focuses on "amenity resources" while designating 76 percent of existing roadless lands to wilderness. It emphasizes management of prime grizzly bear habitat in nonwilderness areas through access restrictions, prescribed burning, and some carefully designated timber harvest to maintain the best relationship of cover to forage. The alternative provides an opportunity similar to Alternative 1 for the Forest to make a significant contribution to the recovered population of grizzly bears.

b. **Criteria and Assumptions:**

(1) Decade 1 timber harvest will be greater than or equal to 70 MMBF/yr.

(2) Wilderness will be managed at full-service level.

(3) Developed recreation will be full service at the heavy use areas, reduced service at other developed sites.

(4) Riparian areas will be managed for wildlife habitat at the high intensity level with no scheduled harvests.

(5) Nonwilderness permitted use will be less than 3,000 AUM/yr.

(6) Restrictive stipulations will be emphasized on more areas of mineral exploration and development.

(7) Public access will be reduced through extensive road closures.

(8) Habitat potential to provide for the grizzly recovery population target of 207 bears will be met or exceeded.

(9) Energy use will be conservative, both In-Service and externally by the public.

(10) Critical view areas will be protected.

(11) No expansion of Big Mountain Winter Sports Area will be accommodated.

(12) Wild and Scenic River and Jewel Basin Hiking Area will be managed at high intensity.

c. **Constraints:**

(1) Constraint: Ending inventory constraint. (See Common Constraints).

(2) Constraint: Nondeclining yield. (See Common Constraints).

(3) Constraint: Value cutoffs.
Rationale: The upper bound on valuation of recreation outputs was equal to projected levels of use. A 15 percent reduction from current levels of range use (3,000 AUM's/year) was used as the upper bound on range.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraint.
Rationale: Visual quality objectives were fixed only on critical viewing areas using the management prescription constraint.

(6) Constraint: Winter range cover constraint. (See Common Constraints).

(7) Constraint: Big-game winter forage constraints. Minimum volume 78 MM lbs./decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 2,000 elk.

(8) Constraint: Management prescription constraints.
Rationale: Based on this alternative's objective of providing nonmotorized recreation opportunities outside wilderness, dispersed recreation prescriptions were fixed on certain roadless areas.

(9) Constraint: Management prescription constraints.
Rationale: To meet the objectives of this alternative, all special areas and wildernesses were designated as high intensity prescriptions. Additions to the existing wilderness was modeled by designating about 75 percent of the current roadless inventory to wilderness as an objective of the alternative. Big Mountain was designated as a low intensity prescription that would not provide for expansion.

(10) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, only high-use developed sites were designated as high intensity prescriptions, using management prescription constraints.

(11) Constraint: Watershed (generalized constraints). (See Common Constraints).

(12) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

18. ALTERNATIVE 17 (FORPLAN ID 110C17) PREFERRED ALTERNATIVE

a. Goals:

The National Forests' multiple-use management philosophy requires maintenance of basic land productivity, yet also allows coordination of Forest management activities with national and local land use trends in a manner consistent with the Forest's ability to supply products and services. The national need for recreational opportunities has greatly increased, with the focus on activities that are low in energy consumption. This national trend and a changing, growing, more recreation-oriented population have increased the importance of the recreation and tourism industry in this area. The national demand, however, for wood products will continue, and the wood products industry will continue to play an important role in the local economy. The Forest should respond to increasing national and local demands for outdoor recreation yet also recognize the importance of timber in the local economy.

Alternative 11 has the same objectives as Alternative 8 along with an additional objective for adding to the Bob Marshall Wilderness and for designation of wilderness in the Jewel Basin area. The ID Team recommended that additions to the Bob Marshall Wilderness should include the roadless area portions with the highest quality wilderness attributes and the most manageable boundaries.

The recommended wilderness additions to the Bob Marshall-Great Bear includes 5,187 acres in the Limestone Cave area of the East South Fork roadless area and 61,110 acres in the Swan Front, Bunker Creek, and Slippery Bill Mountain areas. The goal of this alternative is to provide a level of timber harvest to area mills that is consistent with recent volume levels while at the same time responding to the growing recreational orientation of the Flathead area.

b. **Criteria and Assumptions:**

(1) Decade 1 timber harvest will be greater than or equal to 100 MMBF/yr.

(2) Capacity for 368 MRVD's of nonmotorized dispersed recreation will be provided.

(3) Wilderness will be managed at full-service level.

(4) Developed recreation will be full service.

(5) Riparian areas will be managed for wildlife habitat at the high intensity level with no scheduled harvests on important fisheries streams.

(6) Nonwilderness permitted use will be less than 3,000 AUM/yr.

(7) Use of restrictive stipulations will be moderate on areas of mineral exploration and development.

(8) Public access will be reduced through extensive road closures.

(9) Habitat potential to provide for the grizzly recovery population target of 207 bears will be met or exceeded.

(10) Energy use will be moderate, both In-Service and externally by the public.

(11) Critical view areas will be protected. Recommended VQO's will be reduced in high cost areas.

(12) Expansion of Big Mountain Winter Sports Area will be accommodated.

(13) Wild and Scenic River and Jewel Basin Hiking Area will be managed at high intensity.

c. Constraints:

(1) Constraint: Ending inventory constraint (See Common Constraints).

(2) Constraint: Nondeclining Yield. (See Common Constraints).

(3) Constraint: Value Cutoffs.
Rationale: The upper bound on valuation of recreation and equal to projected levels of use. The upper bound on range was set 3,500 AUM's.

(4) Constraint: Retention visual quality objective constraint. (See Common Constraints).

(5) Constraint: Management prescription constraints.
Rationale: Visual quality objective prescriptions were fixed on about 50 percent of the areas with recommended visual quality objectives and retention or partial retention.

(6) Constraint: Winter range cover constraint. (See Common Constraints).

(7) Constraint: Big-game winter forage constraints. Minimum volume 110 MM pounds/decade for Decades 5-15.
Rationale: Winter range forage objectives were designed to provide enough forage to support a wintering population of at least 3,000 elk.

(8) Constraint: Management prescription constraint.
Rationale: To meet the objectives of this alternative, the wildernesses and special areas were assigned high intensity management prescriptions.

(9) Constraint: Management prescription constraint.
Rationale: To meet the objectives of the alternative, all developed sites were assigned high intensity prescriptions.

(10) Constraint: Watershed (generalized constraints). (See Common Constraints).

(11) Constraint: Watershed and size of opening timber scheduling constraints. (See Common Constraints).

(12) Constraint: Total timber harvest volume constraints required a minimum total harvest for Decade 1 of 250.5 MM cubic feet.
Rationale: This constraint met the objectives of this alternative.

(13) Constraint: Management prescription constraint. (See Common Constraints).

(14) Constraint: Grizzly bear designation fixed on portions of Zone 1 habitat.
Rationale: To meet the objectives of this alternative, grizzly bear management prescriptions were fixed on 94,000 acres of Zone 1 habitat.

(15) Constraint: Timber harvest constraints.
Rationale: These constraints were applied to grizzly bear prescriptions to ensure forage/cover ratios and grizzly habitat objectives are met on suitable lands designated as grizzly bear prescriptions.

(16) Constraint: Management prescription constraints.
Rationale: These constraints were used to accomplish spacial fitting and wilderness addition objectives amounting to 48,800 acres of Bob Marshall Wilderness boundary adjustments in the Swan Front and East South Fork Flathead roadless areas.

CHAPTER VIII. SUMMARY OF EFFECTS OF CONSTRAINTS ON ALTERNATIVES

A. OVERVIEW

The purpose of estimating and displaying these effects is to compare present net value, social and economic impacts, outputs of goods and services, and overall protection and enhancement of environmental resources. This comparative analysis is the basis for evaluating alternatives and selecting a preferred alternative, which are planning steps seven and eight. This section focuses on the economic effects of alternatives and benchmarks. The constraints are discussed in detail in Appendix B, Section VII, and social and environmental effects are discussed in Chapters II and IV.

B. PROCESS FOR EVALUATING SIGNIFICANT CONSTRAINTS

Management objectives of benchmarks and alternatives were achieved by constraining FORPLAN as described in Section VII. The economic tradeoffs, or opportunity costs, of individual constraints can be determined by comparing the PNV of FORPLAN solutions. The change in PNV is the economic tradeoff of achieving a specific objective if both solutions have efficient prescriptions and both solutions maximize PNV. The economic tradeoff was not determined for individual objectives because of the prohibitive costs of analyzing every constraint used to develop alternatives. But by comparing alternatives, the economic tradeoffs of the groups of objectives which have the most significant impact on PNV can be determined. These economic tradeoffs can then be compared to environmental and social consequences to help identify the alternative which maximizes net public benefits.

A major factor in the economic tradeoff analysis is the order in which the objectives are analyzed. For example, the economic tradeoff of meeting management objectives A and B can be determined by comparing FORPLAN solutions with various combinations of the two objectives. The change in PNV due to meeting only A may be $5 MM, and the change due to meeting only B may be $11 MM. The change, however, due to meeting both A and B will probably be less than $16 MM. In addition, the cost of meeting objective A in one alternative will not necessarily be the same as meeting the same objective in another alternative. Therefore, the economic tradeoffs discussed in this section are only relevant to the actual alternative where the objectives were analyzed.

C. TRADEOFFS AMONG ALTERNATIVES

This section discusses the consequences of implementing the alternatives. Three areas are discussed: resource outputs and resolution of resource issues and concerns, effects of constraints, and achievement of nonprice benefits that contribute to net public benefits. Each of these areas are discussed below. Following that each alternative is discussed.

1. OVERVIEW

Nineteen major issues and concerns were identified. They include: supply of recreation opportunities, wilderness designation of roadless areas, management of roadless areas not designated as wilderness, management of existing wilderness areas, management of visually sensitive areas, wildlife habitat management, supply of forage for cattle and sheep, timber output levels, timber harvest and reforestation methods, utilization standards, firewood policy, quantity and quality of water, oil and gas exploration opportunities, landownership adjustments, management of inholdings, management of the soil resource, miles and standards of roads, fire management, and insect and disease management.

Several of these issues are treated the same in each alternative. These include firewood policy, utilization standards, oil and gas exploration opportunities, landownership adjustments, management of inholdings, and fire management. Therefore, the effects of these outputs concerning these issues will not be discussed.

Table B-27 displays the tradeoffs for key resource outputs for each alternative.

TABLE B-27 Quantitative Indicators of Responsiveness of Alternatives to Major Issues and National Concerns (Benchmarks and Alternatives are in order left to right from highest to lowest Present Net Value) - Flathead National Forest

Output/Activity	Benchmark	Alternative								
	PNV	6	7 CD	9	12	13	14	10	11	15
	Million Dollars									
PRESENT NET VALUE	606	578	533	513	505	504	503	502	499	498
NET RECEIPTS										
Decade 1 --------------------->	-2.1	-0.4	0.3	-0.3	-7.9	-7.8	-7.6	-6.0	-8.1	-7.2
5	44.2	38.0	38.8	35.0	39.6	39.0	38.3	36.8	36.1	37.7
NONCASH BENEFITS										
Decade 1 --------------------->	7.0	6.9	6.3	6.5	6.9	6.9	6.9	6.8	6.9	6.9
5	22.4	23.4	19.7	19.6	23.0	22.7	22.7	20.0	22.6	22.2
BUDGET (Avg. Ann. First Decade)	11.1	12.6	12.4	10.1	13.8	13.7	13.5	11.1	14.0	13.2
TIMBER HARVEST	Million Board Feet Per Year									
Decade 1 ---------------------->	103	145	132	103	100	100	100	80	100	99
5	183	175	161	146	165	164	160	144	157	156
LODGEPOLE PINE SAWTIMBER HARVEST (First Decade)	Thousand Acres Per Year									
	2.2	0.3	0.4	2.0	1.7	1.8	1.8	1.9	1.7	2.0
	Million Board Feet									
LONG-TERM SUSTAINED YIELD	155	186	165	129	164	162	159	142	164	154
LAND SUITABLE FOR TIMBER MANAGEMENT	Thousand Acres									
	723	780	722	578	715	707	687	612	717	671
NONWILDERNESS DISPERSED RECREATION (Roaded & Roadless) Opportunities	Thousand Recreation Visitor Days Per Year									
	1393	1600	1571	1016	1584	1528	1465	1208	1623	1388
	Wilderness and Nonwilderness Over-Wintering Population									
ELK POTENTIAL (Fifth Decade) Maximum - 9807 Elk	5492	5960	6698	4676	7800	7800	7800	7243	7800	7220
	Bears-Wilderness and Nonwilderness Population									
GRIZZLY BEAR POTENTIAL Maximum - 230 to 250 Bears	184	191	190	212	201	202	202	195	201	202
	Thousand Acres									
ROADLESS MANAGEMENT EMPHASIS	299	352	386	97	320	281	279	275	338	243
POTENTIAL VISUAL QUALITY OBJECTIVES ACHIEVED (Ret. and Partial Ret.)	Thousand Acres (Nonwilderness)									
	356	69	329	129	440	385	383	335	458	347
	Thousand Acres									
ADDITIONAL WILDERNESS	0	0	0	495.3	82.4	143.2	196.6	196.7	48.8	260.2
	Miles									
ROADS TO BE CONSTRUCTED	3379	3602	3455	2258	2856	2840	2783	2752	2875	2717
	Person Years - Change from 1980 Situation									
CHANGE IN EMPLOYMENT	89	696	435	73	205	197	196	-207	209	176

TABLE B-27 (Continued)

Output/Activity	Alternative 2	4	8	3	5	17(PA)	1	16	Benchmark MINLVL
	Million Dollars								
PRESENT NET VALUE	495	494	493	490	489	483	477	467	100
NET RECEIPTS									
Decade 1 --------------------->	-8.0	-5.2	-8.3	-7.4	-7.2	-8.1	-7.7	-6.6	-2.2
5	40.4	41.6	39.2	35.2	36.9	34.6	34.8	31.5	0
NONCASH BENEFITS									
Decade 1 --------------------->	6.9	5.9	6.9	6.9	6.9	7.1	6.9	6.7	4.5
5	22.4	19.7	23.4	23.2	22.3	22.1	22.0	20.1	8.7
BUDGET (Avg. Ann. First Decade)	14.5	9.4	14.0	13.5	11.8	13.7	12.4	10.8	3.2
TIMBER HARVEST	Million Board Feet Per Year								
Decade 1 --------------------->	116	51	100	101	82	101	82	71	0
5	177	176	166	160	151	152	151	124	0
LODGEPOLE PINE SAWTIMBER HARVEST (First Decade)	Thousand Acres Per Year								
	3.2	0.9	2.0	1.8	2.4	2.0	2.4	1.5	0
	Million Board Feet								
LONG-TERM SUSTAINED YIELD	180	175	165	166	152	149	154	135	0
LAND SUITABLE FOR TIMBER MANAGEMENT	Thousand Acres								
	775	737	720	715	651	671	673	512	0
NONWILDERNESS DISPERSED RECREATION (Roaded & Roadless) Opportunities	Thousand Recreation Visitor Days Per Year								
	1576	1259	1673	1594	1509	1599	1453	1122	789
	Wilderness and Nonwilderness Over-Wintering Population								
ELK POTENTIAL (Fifth Decade) Maximum - 9807 Elk	8694	6902	7800	8380	7697	7800	6524	4900	4041
	Bears-Wilderness and Nonwilderness Population								
GRIZZLY BEAR POTENTIAL Maximum - 230 - 250 Bears	190	152	200	197	195	205	215	216	212
	Thousand Acres								
ROADLESS MANAGEMENT EMPHASIS	394	139	385	429	450	296	321	164	9
POTENTIAL VISUAL QUALITY OBJECTIVES ACHIEVED (Retention and Partial Retention)	Thousand Acres (Nonwilderness)								
	195	195	392	464	321	410	319	275	0
	Acres								
ADDITIONAL WILDERNESS	0	0	0	0	0	98.1	0	373.8	0
	Miles								
ROADS TO BE CONSTRUCTED	3170	3142	2800	2960	2920	2771	2942	2526	0
	Person Years - Change from 1980 Situation								
CHANGE IN EMPLOYMENT	498	-707	213	-60	-138	201	-68	-344	-1932

To discuss the effects of constraints, each alternative is compared to the Maximum PNV Benchmark. The difference between the PNV of an alternative and PNV of that benchmark represents the foregone investment opportunity to the government or opportunity cost. The Maximum PNV Benchmark is used as a basis for comparing alternative objectives expressed as FORPLAN model constraints. Alternatives are formulated by adding additional resource requirements to reflect the objectives of the alternative. As objectives are added, FORPLAN formulations may become more constraining, resulting in less cost-efficient solutions and lower PNV. The degree to which alternatives vary in economic efficiency in achieving both priced and nonpriced objectives is the focus of the remaining section.

In general, the PNV of alternatives increases with the size of the timber program unless the timber harvest is over the level that maximizes PNV. Changes in the timber program are caused by constraints or other objectives which preclude regulated timber harvest, change the intensity of timber harvest, or set a first decade timber harvest objective.

Nearly all the alternatives had similar constraints imposed to reach resource management objectives. These constraints included the following:

a. All alternatives were spacially fit for the timber designations to ensure that those designations are implementable. Alternative 6, however, does not have spacially fit dispersed recreation designations. The FORPLAN computer model designates all nonproductive land as dispersed recreation management prescriptions to obtain dollar benefits from recreation opportunities with no consideration for the suitability of that designation. Although the Maximum PNV Benchmark and Alternative 6 would be implementable, quality recreational opportunities would not be ensured. The other alternatives do have spacially fit recreation designations, resulting in some cases in decreased PNV's.

b. Constraints designed to ensure proper cover/forage relationships and timber stand age class distribution on mule deer, elk, and whitetailed deer winter ranges were applied to all alternatives except Alternative 6. These constraints lower PNV.

c. All alternatives, except Alternative 6, have restrictive watershed constraints imposed on specific geographic areas for the first decade to meet the management objectives of the alternative. These constraints decrease timber harvest in the first decade, thus reducing PNV. The PNV Benchmark and Alternative 6 have generalized watershed constraints. These are designed to regulate regeneration harvest on lands where the majority of past timber harvesting has occurred in an effort to decrease unacceptable impacts on water quality and quantity. These constraints reduce but do not prevent relatively severe watershed impacts.

d. Constraints which ensure that a desired level of visual quality is maintained when timber harvesting occurs increase the costs of timber management. Each alternative reflects a level of consideration for visual quality requiring different sets of visual quality constraints. All alternatives except Alternative 6 and the Maximum PNV Benchmark include constraints that ensure visual quality on critical viewing areas. Although the acres affected by these constraints are few in those alternatives which meet only the critical visual concerns, some reduction in PNV occurs in all but Alternative 6 and the Maximum PNV Benchmark.

e. Alternative 6, the Maximum PNV Benchmark, and Current Direction do not include the scheduled timber harvest from the first 3 years of the 5-Year Timber Management Plan. All other alternatives, however, require that these areas be harvested in the first decade. These areas were selected outside the FORPLAN analysis. This selection may decrease the PNV's of the alternatives.

f. All alternatives used the nondeclining yield constraint. This constraint, which ensures that subsequent periodic harvest volumes are greater than or equal to the previous periods' volume, decreases PNV by allowing less flexibility in harvest schedules.

As constraints are added or changed in an alternative, discounted benefits and costs change. The discounted costs of an alternative represents the present value of all expenditures required by the government to implement an alternative. The minimum cost for National Forest System land administration is defined by the Minimum Level Benchmark. Table B-28 displays the discounted costs, discounted benefits, and PNV in order of increasing costs. In general, the costs of alternatives increase with the size of the timber and road construction programs. By comparing the benefits and costs of an alternative with another alternative with similar goals, the economic consequences of the additional expenditure can be compared to the additional nonpriced benefit values. Table B-29 shows the present net value of each alternative in decreasing order. Table B-30 shows the discounted costs and discounted benefits by major resource category.

Nonpriced outputs were evaluated to determine which alternative maximized net public benefit. Net public benefit is important because it represents the overall value to the Nation of all benefits less all costs, regardless of whether the costs and benefits are expressed in priced or nonpriced terms. Net public benefit defines the priced and nonpriced value of each alternative. The nonpriced outputs are:

a. Big-game hunting quality
b. Dispersed recreation setting quality and diversity
c. Threatened and endangered species habitat
d. Water quality
e. Visual quality of the Forest landscape
f. Nongame species wildlife habitat
g. Local economic stability
h. Nonrecreation wilderness values

These major nonpriced benefits are described in detail in Appendix B, Section IV, C. In general, as more nonpriced outputs are provided, the present net value decreases.

Beginning with the Maximum PNV Benchmark as a base, net public benefit is improved when the benefits of providing additional nonpriced objectives exceed the opportunity cost of doing so. Net public benefit is maximized by the alternative which has the greatest excess of benefits over costs. The choice of the alternative that maximizes net public benefit is a subjective decision.

TABLE B-28 Present Value Costs, Benefits, and Present Net Value - Flathead National Forest

Alternative/	Present Value Costs		Present Value Benefits		Present Net Value	
Benchmark	MM$	Change	MM$	Change	MM$	Change
Minimum Level	73		173		100	
9	331	258	844	671	513	413
16	335	4	802	-42	467	-46
10	351	16	853	51	502	35
4	361	10	855	2	494	-8
1	383	22	860	5	477	-17
5	384	1	872	12	489	12
15	387	3	887	15	498	9
14	399	12	902	15	503	5
Maximum PNV	400	1	1006	104	606	103
17 PA	401	1	884	-122	483	-123
13	406	5	910	26	504	21
12	411	5	917	7	505	1
11	413	2	912	-5	499	-6
3	415	2	904	-8	490	-9
8	425	10	917	13	493	3
6	436	11	951	34	495	2
7 CD	439	3	972	21	533	38
2	456	17	1014	42	578	45

TABLE B-29 Present Net Value - Flathead National Forest

Alternative/	Present Net Value		Present Value Benefits		Present Value Costs	
Benchmark	MM$	Change	MM$	Change	MM$	Change
Maximum PNV	606		989		384	
6	578	-28	1014	25	436	52
7 CD	533	-45	972	-42	439	+ 3
9	513	-20	844	-128	331	-108
12	505	- 8	917	+73	411	+80
13	504	- 1	910	- 7	406	- 5
14	503	- 1	902	- 8	399	- 7
10	502	- 1	853	-49	351	-48
11	499	- 3	912	+59	413	+62
15	498	- 1	887	-25	389	-24
2	495	- 3	951	+64	456	+67
4	494	- 1	855	-96	361	-95
8	493	- 1	917	+62	425	+64
3	490	- 3	904	-13	415	-10
5	489	- 1	872	-32	384	-31
17 (PA)	483	- 6	884	+12	401	+17
1	477	- 6	860	-24	383	-18
16	467	-10	802	-58	335	-48
Minimum Level	100	-367	173	-629	73	-262

TABLE B-30 Discounted Benefits and Costs for Resource Groups (Million Dollars) - Flathead National Forest

		Discounted Benefits				Discounted Costs		
Alternatives/ Benchmark	Present Net Value	Timber	Recreation	Range	1/ Other	Timber	Roads	Other
Max PNV	605.5	641.8	321.7	1.4	24.4	122.0	159.4	102.2
6	577.7	662.8	325.9	1.4	24.4	143.1	174.8	118.7
7CD	532.7	669.3	277.3	1.2	24.4	140.7	176.9	121.3
9	512.9	516.6	301.6	1.4	24.4	105.5	116.4	109.2
12	505.3	561.5	329.4	1.3	24.4	130.9	154.4	126.0
13	504.4	556.5	328.2	1.3	24.4	129.8	151.7	124.4
14	503.0	547.2	329.6	1.3	24.4	128.0	148.5	122.9
10	502.2	523.5	304.4	1.1	24.4	95.7	136.3	119.0
11	499.4	556.1	330.2	1.3	24.4	129.1	156.4	127.0
15	497.7	536.3	326.2	1.3	24.4	123.9	144.3	121.2
2	494.7	611.5	313.8	1.4	24.4	163.9	168.0	124.5
4	493.8	584.0	244.6	1.6	24.4	107.2	136.2	117.3
8	492.8	566.0	325.7	1.3	24.4	131.8	164.5	128.3
3	489.6	554.1	324.7	1.3	24.4	128.1	159.9	127.0
5	488.5	527.2	319.6	1.1	24.4	100.5	157.8	125.5
17	483.0	552.7	331.2	1.3	24.4	125.6	149.0	126.6
1	476.5	515.9	318.5	1.1	24.4	101.5	155.3	126.4
16	466.8	468.7	308.3	1.1	24.4	84.9	133.6	116.9
Min Level	100.1	0.0	156.0	.4	16.9	.0	.0	73.2

1/ Includes Mineral Leasing, Land Use, and Power.

2. ALTERNATIVE 1

a. Resource Outputs

This alternative emphasizes maintenance and enhancement of prime grizzly bear habitat, existing roadless areas, nongame wildlife, old-growth habitat, and fisheries. Production of commodity resources such as timber and oil and gas is constrained by consideration of impacts on other resources.

Timber harvest levels are low compared to most of the other alternatives. First decade average annual timber harvest is 82 MMBF, with a long-term sustained yield of 154 MMBF, fourth lowest of the alternatives.

The grizzly bear management provides habitat to support 215 bears. This habitat index indicates that this alternative has one of the highest potentials for the Forest to contribute to the Northern Continental Divide Ecosystem grizzly recovery goals.

Dispersed recreation opportunities in both the roaded and unroaded environment are moderate in the range of alternatives. The road management program would reduce the existing level of unrestricted road access to the Forest in order to achieve habitat objectives. The total number of roads on the Forest will double. Many of the existing unroaded areas are maintained in an unroaded state; however, some will be roaded to achieve grizzly bear habitat management objectives. These roads will be closed to public motorized access after they have been used. Wildernesses are managed with higher levels of funding. This allows improved mitigation of the impacts of recreation use on the wilderness resource. No new wilderness is recommended.

Big-game management opportunities are restricted by other resource management objectives; therefore, potential wintering populations are fourth lowest of all the alternatives by the fifth decade. Similarly, nonwilderness permitted livestock grazing is reduced by other resource considerations to the lowest level of all the alternatives.

Visual quality of the Forest would be in the midrange of the alternatives with 61 percent of the Forest's potential visual quality objectives met by various land designations.

b. Analysis of Constraints

PNV = $476,500,000
Opportunity Cost = 129,000,000
Discounted Cost = $383,200,000

This alternative achieves a PNV of $476.5 MM, the second lowest of all the alternatives.

Alternative 1 has the second highest opportunity cost of all the alternatives - 122 million dollars. This is because Alternative 1 has low timber harvest levels, and more timber harvest scheduling constraints compared to the other alternatives. This alternative also manages for a high level of "amenity values" which contribute little PNV.

In addition, the PNV is decreased by the costs associated with the grizzly bear management objectives, which apply to over 322,000 nonwilderness acres (about 25 percent of the nonwilderness land base). Timber harvest and prescribed burning would occur, but would be designed to maintain the desired mix of grizzly bear habitat components and cover/forage ratio. These constraints decrease timber management options and increase management costs.

c. Net Public Benefits

Under Alternative 1, big-game hunting quality would change slightly from the existing situation. The potential forage production for elk and deer populations is second lowest of all the alternatives. Grizzly bear habitat management objectives preclude achieving correct cover/forage relationships and high forage production on the potential elk and mule deer winter range on the Spotted Bear Ranger District. Amenity resource management objectives elsewhere on the Forest limit management opportunities on whitetailed deer winter range. Elk and deer populations would be relatively low by the third and fourth decades perhaps resulting in lowered hunting success opportunities. A restrictive road management program would decrease access slightly over existing levels. Therefore, nonmotorized hunting quality would remain high. High levels of security from human disturbance would be provided to big-game populations. Hunting season restrictions could be imposed in an effort to increase the big-game populations*, but the capacity of the habitat of the Forest would remain limited due to other management objectives.

Two of the important dispersed recreation settings on the Forest are managed under this alternative to achieve other "amenity value" objectives. The north end of Glacier View Ranger District and the Spotted Bear River are managed to maintain grizzly bear habitat. The Swan Mountain Range and Glacier Slough would be managed to provide dispersed recreation opportunities. Although this alternative does not overtly focus on providing recreation opportunities, the mix of other resource objectives and land designations throughout the Forest result in high roadless recreation setting quality and diversity. Roaded recreation opportunities would remain similar to existing or decrease slightly due to the restrictive road management program.

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* The State of Montana has responsibility and authority for setting hunting seasons and limits.

The quality of grizzly bear and gray wolf habitat would increase under this alternative, providing the Forest's share of opportunities to meet and exceed the objectives for a recovered population of grizzly bears. This alternative would manage the most acres to improve grizzly bear habitat of all the alternatives and would have the fewest acres where management to meet other resource objectives would conflict with grizzly bear and gray wolf objectives.

Water quality under Alternative 1 would remain relatively high over the first and second decades; however, localized adverse impacts on fisheries and water-based recreation opportunities could still occur. Water quality would remain higher than most other alternatives in the fifth decade. Alternatives 1 and 5 provide the best water quality over the next 50 years.

Under Alternative 1, a moderate proportion (61 percent) of the potential visual quality objectives would be retained, resulting in a Forest environment with good scenic quality. The majority of the visual quality is associated with land designations that do not permit timber harvesting.

At the end of the first and fifth decades, habitat to support snag cavity and old-growth dependent species would be highest of all the alternatives. Old growth would be protected by management objectives for grizzly bear habitat, dispersed recreation, and other amenity resources, including nongame species. Habitat for general forest users and tree dependent species would be similar to that provided by other alternatives. Habitat to support grass forb and shrub users would be sufficient to meet viable population requirements but less than that provided under other alternatives. Habitats for other nongame species are generally provided to the same degree by all alternatives. This alternative would provide a high level of management emphasis focused on nongame species.

Over time, the variety of plant communities would be lower than most other alternatives. Where timber harvest was not scheduled, the Forest would advance to the later plant successional stages. Grizzly bear management habitat would provide opportunities to use fire to alter vegetative patterns. Generally, however, the high level of amenity resource land designations would lead to decreased variety over time.

Employment opportunities decline in the first decade, particularly in the wood products industry. Potential employment associated with recreation opportunities, especially those associated with hunting and fishing, partially offset the decline in economic stability that would result from decreased timber harvest levels.

Local residents' access to the Forest would decrease even though more roads would be constructed over time. Recreation opportunities would be provided throughout the Forest, but the north end of the Glacier View Ranger District and Spotted Bear Ranger District could become more restrictive over time due to grizzly bear management objectives. Firewood gathering opportunities would be slightly less than current due to reduced timber harvest levels and restrictive access. Hunting quality could be impacted. This alternative would result in significantly changed relationships to the Forest. This could impact existing land-use patterns and lifestyles.

3. ALTERNATIVE 2

a. Resource Outputs

This alternative focuses on the active use of National Forest System lands and on resource development. It provides for high levels of commodity extraction tempered by concern for other resources. In this alternative, there would be fewest restrictions on people's use of the Forest.

First decade average annual timber harvest is 116 MMBF, third highest of all alternatives. The long-term sustained yield is 180 MMBF, second highest of the alternatives.

This alternative has a high level of dispersed recreation opportunities also contribute to the PNV of this alternative. Roadless acres are managed expressly to provide roadless recreation opportunities that are high. Funding for management is also generally high; therefore, this alternative would create an environment where trails and trailhead facilities were well maintained throughout the Forest. The road management program provides a high level of road access to the Forest. Wildernesses are managed with higher intensities of management and funding only where high levels of use are currently impacting the wilderness resource. No additions to current wilderness are recommended.

Big-game management opportunities are the best of all the alternatives from the third through eighth decades. Although potential big-game populations are high, the high level of road access will adversely affect roadless hunting opportunities.

Permitted livestock AUM's are second highest of all the alternatives. Visual quality objectives are relatively low; 38 percent of the potential visual quality objectives are met. Concerns about the visual resource are confined to critical viewing areas.

b. Analysis of Constraints

PNV = $494,700,000
Opportunity Cost = $110,800,000
Discounted Cost = $456,400,000

This alternative has a PNV of $494.7 MM, midrange of all the alternatives, and an opportunity cost of $110.8 MM.

The slightly lower funding levels for wilderness management, implying fewer recreation benefits to contribute to PNV, decrease this alternative PNV from Alternative 6. Additional constraints are on timber harvest visual quality areas, big-game winter ranges, and individual analysis areas than the Maximum PNV Benchmark and Alternative 6.

The discounted costs for this alternative are the highest of any of the alternatives. Funding for all types of management - recreation, wildlife, range, and timber - are at a high level in this alternative. This high level of funding contributes to the high discounted costs, as well as high levels of investments in timber management and roads.

c. Net Public Benefits

Alternative 2 would alter the quality of big-game hunting due to significant increases in motorized access. Hunting season access would be almost double the existing situation, affording hunters quick and easy harvest opportunities. Year-round access also increases, reducing big-game security. By the fifth decade, few unroaded environments would remain outside the wildernesses, reducing the variety of environmental settings available to the hunter. The potential impacts of increased motorized access are somewhat offset by the high elk, mule deer, and whitetailed deer population potentials.

Increased motorized access to the Forest lands would increase the variety of roaded recreation settings. Roadless dispersed recreation generally would be limited to nonproductive lands of the Forest. Some of the productive areas including portions of the north end of Glacier View Ranger District, the Spotted Bear River, Glacier Slough, and the Swan Range would be accessed and harvested. The variety of roadless settings would be reduced in this alternative.

Some highly productive grizzly bear habitat would be roaded and managed for timber production. Roading these areas, while not lowering the population, would lower the quality of the habitat. High levels of access would decrease the population's security from human disturbance.

Water quality throughout the Forest would be at relatively high risk under Alternative 2. Acceptable risk levels would be exceeded in most watersheds of all alternatives except Alternative 6.

This alternative would significantly reduce the overall visual quality of the Forest compared to the current situation; however, the critical viewing areas--the most frequently seen by area residents and visitors--generally would retain or partially retain their natural appearance.

Sufficient habitat to maintain viable populations of all nongame species would be maintained. By the fifth decade, old-growth habitat for old growth and snag cavity dependent species would be among the lowest of all alternatives, while habitat for grass forb and shrub dependent species would increase significantly. Comparatively few acres would be managed specifically to provide nongame species habitat.

The composition of plant communities under Alternative 2 would be relatively varied, affected by timber harvest. Management which would preclude timber harvest generally would occur in high areas on nonproductive lands, so the majority of the timbered lands would be subject to regulated manipulation of the vegetation.

The increase in employment opportunities resulting from increased timber generally increases economic stability. Potential declines, however, in employment opportunities in recreation and tourism businesses resulting from lower hunting opportunities could degrade economic stability slightly.

High levels of motorized access to the Forest would afford residents of the area opportunities to gather firewood and pursue a variety of active recreational activities. Existing big-game hunting and fishing settings, however, would change over time, impacting a significant component of local lifestyles. Existing relationships to the Forest would change as unroaded areas are accessed for timber production, and the natural-appearing landscape is modified.

4. ALTERNATIVE 3

a. Resource Outputs

The goal of Alternative 3 is to provide a level of timber harvest to local mills that is consistent with recent harvest volume levels while at the same time responding to the growing recreational use of the Flathead Valley. Because a significant portion of the Flathead National Forest is frequently viewed by recreationists, this alternative would focus on maintaining a pleasant setting. While timber harvest activities would be allowed to occur in frequently seen areas, they would be designed to minimize the impact on the view.

About 89 percent of the Forest's potential visual quality objectives would be met, the highest of all the alternatives. Timber management is more costly due to these objectives. In addition, the timber harvest level of this alternative is 101 MMBF per year in the first decade, consistent with the average Forest harvest volumes of the last 10 years. Long-term sustained yield is 165.5 MMBF, fourth highest of the alternatives.

The high level of dispersed recreation opportunities of this alternative also contribute to the PNV. High funding levels provide management opportunities to highlight the Forest's recreation settings. Roaded recreation opportunities are also high. The road management program provides road access opportunities that are moderate in the range of alternatives, increasing substantially during the summer but only slightly during hunting season. Wilderness management is conducted more intensively and with higher funding levels to improve the quality of wilderness recreational opportunities. No new wilderness is recommended.

Big-game population potentials are fourth highest of all the alternatives by Decade 2. About 38,000 acres managed to meet grizzly bear habitat objectives increase the Forest's grizzly bear population potential. Livestock grazing would be moderate in the range of alternatives.

b. Analysis of Constraints

PNV = $489,600,000
Opportunity Cost = $115,900,000
Discounted Cost = $415,000,000

The PNV achieved is 489.6, ranking fifth lowest of all the alternatives.

Alternative 3 has an opportunity cost of almost 116 million dollars. Alternative 3 displays a lower PNV because of the high level of visual quality objectives. High funding for recreation opportunities providing benefits, similar to the Preferred Alternative, somewhat offsets the higher costs of managing to retain visual quality. Relatively high levels of big-game winter range habitat, riparian fisheries management, roadless dispersed recreation, along with moderate grizzly bear habitat emphasis increase costs and constrain timber harvests compared to the Maximum PNV Benchmark.

c. Net Public Benefits

Alternative 3 would generally maintain the existing quality of big-game hunting over time. Moderate increases in access would occur as the roads needed for management are constructed. Restrictions on motorized access, however, would be imposed to meet management objectives. Roadless dispersed recreation land designations provide security from human disturbance for big game and an unroaded hunting environment. Management of between 75 and 85 percent of the potential winter ranges to improve forage production would increase potential elk, mule deer, and whitetailed deer populations over time. Increased big-game numbers could offset the potential impacts of slightly increased access.

Alternative 3 provides the highest level of variety in roaded and roadless dispersed recreation settings distributed throughout the Forest. Total acres managed to provide roadless recreation are highest of all the alternatives. Generally, quality settings, including those of high public concern, would be protected. Roaded recreation opportunities would be restricted by the road management program, but the quality and variety of opportunities should be higher than exists currently.

Under Alternative 3, the Forest's share of a recovered population of grizzly bears is approached. Some of the highly productive grizzly bear habitat is managed to improve food production and cover forage relationships. Other portions, however, would be roaded and managed for timber production. High levels of roadless dispersed recreation and other amenity resource land designations provide some habitat security.

Under Alternative 3, activities with potential risk to water quality would occur in watersheds throughout the Forest to a moderate level in Decades 1 and 2. Soil-disturbing activities would increase slightly by Decade 5.

Alternative 3 would maintain a Forest environment where the visual quality over time improved from the existing situation and would be of higher quality than in the other alternatives. This alternative meets more of the inventoried potential visual quality objectives than any other alternative.

Nongame species habitat is protected and moderately enhanced in Alternative 3. The percentage of Forest lands contributing old growth and snag cavity habitat is moderate in comparison to other alternatives. Other types of habitat to support all nongame species would exist at moderate levels by the end of the fifth decade. Some areas would be managed specifically for nongame species.

The variety of plant communities would improve over the existing situation generally through timber harvest. Those acres on which roadless dispersed recreation opportunities are provided would advance to the later plant successional stages. Grizzly bear habitat would provide opportunities for use of fire in limited areas.

Economic stability would be promoted by Alternative 3, with management emphases placed on the full array of resources significant to the local economy. Economic growth would be slow but spread throughout important industrial sectors.

This alternative and the Preferred Alternative would provide the best opportunities to maintain existing land use patterns and lifestyles. Local residents would be afforded access to the Forest, yet access restrictions would be sufficient to maintain a variety of settings for hunting, fishing, and other activities occurring in a forested environment. Some roadless environments would be maintained. Firewood would continue to be accessible.

5. ALTERNATIVE 4

a. Resource Outputs

The objective of this alternative is to provide a high level of revenue to the Federal Treasury while maintaining the lowest level of costs possible. Commodity resources are emphasized. Their management is guided primarily by economic criteria. Management for goods and services that do not produce revenue would be minimal and limited to areas where existing use of the Forest is high.

The long-term sustained yield (175 MMBF) is third highest of the alternatives. In addition, the low timber harvest levels of the first two decades (51 MMBF and 86 MMBF) provide opportunities to delay timber harvest until the real price increases exceed the discount rate. These harvest levels are the lowest of any alternative and reflect profit emphasis. These harvest levels adversely affect the local economy, causing decreases in employment.

This alternative does not highlight recreation opportunities because recreation contributes few revenues to the Federal Treasury. All wildernesses, Wild and Scenic River areas, and Jewel Basin are managed at low funding levels. No new wilderness is recommended. Alternative 4 provides the lowest developed and roadless dispersed recreation opportunities. The number of permitted AUM's is fourth highest of all the alternatives.

Big-game winter range management is low considering the range of alternatives considered. The road management program would maintain a high level of public road access. Visual quality is not emphasized because of the costs. About 38 percent of the Forest's potential visual quality objectives are met, and only in critical viewing areas.

Under this alternative, oil and gas exploration and development would have the least constraints compared to other alternatives.

b. Analysis of Constraints

PNV = $493,800,000
Opportunity Cost = $111,700,000
Discounted Cost = $360,700,000

The PNV of this alternative is $493.8 MM, near the midrange of all the alternatives.

Alternative 4 has an opportunity cost of 111.7 million dollars. In addition to the general constraints, this business like alternative provides limited opportunities for recreation use. Because recreation use opportunities provide benefits computed in the PNV of the Forest, this alternative provides a lower PNV. This alternative is the most productive of commodity benefits per dollar spent of all the alternatives. Recreation management is financed on the highest value areas with existing investments such as trails. Minimum management to reduce costs is featured on a large part of the noncommodity-producing areas of the Forest. The decade 1 timber harvest floor is relaxed to permit higher profits from timber sales, however, nondeclining yield is maintained.

Although receipts to the Treasury are emphasized, PNV is still reduced from the Maximum PNV Benchmark due to production of some recreation, visual quality, big-game winter range, and other amenity values at higher levels.

c. Net Public Benefits

Alternative 4 would alter big-game hunting quality from the existing situation. Potential populations, particularly of whitetailed deer, would be low relative to other alternatives. Revenue maximizing management objectives preclude any significant investment in winter range management. Access to the Forest would be relatively unrestricted. Few unroaded areas would remain by the fifth decade. Hunters would have easy access to most of the nonwilderness Forest. Populations of elk and deer could be harvested more easily and quickly. By the fourth and fifth decades, hunter success opportunities could be significantly impacted.

The limited emphasis on recreation in this alternative results in low dispersed recreation setting quality and diversity. Roadless recreation is emphasized on relatively few acres and only where existing use levels are high. Many of the areas with high quality roadless dispersed recreation potential are accessed and managed for timber or managed with minimal investment. The productive acres of the north end, the Swan Range, Glacier Slough, and Spotted Bear River are accessed. The variety of roaded recreation settings would increase as more areas of the Forest are accessed.

Under Alternative 4, opportunities to achieve a recovered population of grizzly bears are most limited of all alternatives. The timber harvest and roads would impact most productive grizzly bear habitat. Minimum management on a high proportion of the Forest would not allow for any habitat improvement.

The relatively low first and second decade timber harvest levels protect the Forest's watersheds. This alternative would have relatively few watershed risks for these decades. By Decade 5, however, potential watershed impacts would be among the worst of all the alternatives.

The visual quality resulting from implementation of Alternative 4 would be very similar to that discussed for Alternative 2.

Habitat for nongame species would be provided only as a consequence of achieving other management objectives. Old growth would be retained in early decades due to low timber harvest volumes but, by Decade 5, acres contributing old-growth habitat would be reduced. Other habitats for nongame species would be provided at moderate levels.

Alternative 4 would provide plant community variety that would be similar to Alternative 3. Timber harvest would improve the existing distribution of tree species and age classes.

Economic stability under Alternative 4 would be significantly and adversely impacted by low timber harvest volumes and low recreation opportunities. Losses in employment opportunities would be higher than under any other alternative.

This alternative would alter existing relationships to the Forest. Unroaded areas would be accessed, and the visual quality of the Forest would be modified. Roaded access opportunities would be very high, but opportunities for hunting and recreation would be low. The Forest would be minimally managed for local residents' use, providing instead opportunities to return dollars to the Federal Treasury.

6. ALTERNATIVE 5

a. Resource Outputs

This alternative emphasizes protective management in some areas of the Forest where roadless and/or wildlife values are believed to be highly significant. The Swan Mountain Range, the Le Beau area of the Tally Lake Ranger District, and the roadless portions of the north end of the Glacier View and Spotted Bear Ranger Districts would be managed for roadless recreation, watershed protection, wildlife, and other amenity values. In other areas, timber management would be emphasized. No additions to the existing National Wilderness Preservation System would be made at this time, but future options would be preserved.

The first decade timber harvest of 82 MMBF is similar to Alternative 1. The long-term sustained yield of 152 MMBF is the fourth lowest of all alternatives. In addition, this alternative has the third smallest land base suitable for timber management. This decreases the potential benefits generated through timber harvest.

This alternative maintains the largest nonwilderness acreage in a roadless state of all the alternatives. Protection of these unroaded areas provides security from human disturbance for wildlife, including grizzly bears. The potential bear population could increase from the current level, but habitat potential in the long term ranks fourth lowest among alternatives. About 98 percent of the potential winter ranges are managed to reach the desired forage production and cover/forage relationships. While big-game population potential does not immediately increase, it does over the long term, becoming the highest of all alternatives. Road management is oriented toward maintaining the current level of road access during the hunting season and only slightly increasing year-round access. Visual quality under this alternative would be moderate considering the range of alternatives and very similar to Alternative 1. Nonwilderness recreation opportunities also would be moderate. Management of the wildernesses would intensify to mitigate impacts of recreationists and protect the wilderness values. No additions to the existing National Wilderness Preservation System would be made at this time, but future options would be preserved.

b. Analysis of Constraints

PNV = $488,500,000
Opportunity Cost - $117,000,000
Discounted Cost = $383,800,000

The PNV of this alternative is $488.5 MM, fourth lowest of all the alternatives.

Alternative 5 has an opportunity cost of almost 117 million dollars, very similar to Alternative 3. This alternative, however, reflects the costs of a reduced timber base and a high level of amenity land designations with very little of the reduction in PNV associated with visual considerations. The relatively low long-term sustained yield has the effect of lowering PNV. This alternative has a high level of constraints on the production of commodity outputs due to the emphasis of roadless resource values. The suitable timber base is restricted to the high productivity site which are currently roaded or partially roaded.

c. Net Public Benefits

Alternative 5 would maintain, or perhaps slightly increase over time, the quality of big-game hunting. The majority of existing unroaded areas of the Forest would remain unroaded, providing big-game security from human disturbances and settings for roadless hunting experiences. The miles of road needed for management would be fewer than under other alternatives. Motorized access during hunting season would remain at the existing levels although year-round access would slightly increase. Over time, population levels would be expected to increase as high investments in winter range management are made on over 95 percent of the potentially suitable winter range acres.

Lower timber harvest in the early decades, however, delays increased forage production. Hunters' opportunities for success would remain stable or increase as restrictions on motorized access and winter range management allowed populations opportunities to increase.

Alternative 5 would retain the roadless areas which have special recreation and other resource values (including the north end, the Swan Range, Glacier Slough, and Spotted Bear River) thereby providing the highest potential for primitive roadless dispersed recreation opportunities of all the alternatives. The distribution of roadless opportunities, however, is limited because some areas of the Forest would have no management direction for dispersed recreation. Roaded recreation opportunities would be limited by the restrictive road management program.

Alternative 5 would provide potential habitat that would allow the potential grizzly bear and gray wolf population to approximate that provided for by Alternative 3. Under Alternative 5, however, highly productive grizzly bear habitat on the Glacier View and Spotted Bear Districts would be managed to provide roadless dispersed recreation opportunities. No additional roads would be constructed, thus security would be maintained. Habitat, however, could change over time and quality decrease from current levels.

Water quality would be very similar to that provided by Alternative 1. Over the long run, water quality would be best protected by this alternative.

The visual quality associated with Alternative 5 would be very similar to Alternative 1.

Under Alternative 5, nongame species habitat would be emphasized more than under other alternatives due to the protection of large roadless acres, management of riparian areas for wildlife, and designation of land as management of nongame species habitat. By the fifth decade, habitat to support old growth and snag cavity dependent species would be among the highest of all alternatives.

Alternative 5 would have low potential for maintaining varied plant communities. Timber would be managed on the third lowest of all the alternatives. Land designations which do not allow timber harvest would provide limited opportunities for the use of fire. Much of the Forest would advance to the later plant successional stages.

7. ALTERNATIVE 6

a. Resource Outputs

The goal of this alternative is to maximize the PNV (present net value) of the Forest while achieving high commodity resource production levels for all resource uses and products from the Forest. Resources would be managed as intensively as possible.

Timber harvest levels eventually reach 175 MMBF. The long-term sustained yield capacity is 186 MMBF, again the highest of all the alternatives.

This alternative meets the direction in the President's "Statement of Policy" which states that "at least one alternative in the DEIS will be developed to determine how the 1980 RPA (Forest and Rangeland Renewable Resources Planning Act) program could best be implemented on the Forest. National demand for Forest resources are reflected in the RPA output objectives assigned to the Forest through the Northern Region Plan."

This alternative exceeds the RPA timber program in all decades. Permitted livestock grazing, although highest of all the alternatives, does not achieve RPA grazing objectives beyond the first decade. RPA objectives for dispersed and developed recreation are exceeded by this and all other alternatives.

Roadless dispersed recreation opportunities in this alternative are provided on lands not suitable for timber production. This does not allow for recreation management of high quality recreational settings in the potentially suitable land base. Wilderness management is intensified to increase the wilderness recreation benefits. No new wilderness is recommended. The road management program provides for one of the highest levels of road access, more than doubling the current levels of access to the Forest.

Changes in the Forest landscape would be most noticeable of all the alternatives. This alternative has the largest suitable land base and the fewest constraints on timber harvest designed to maintain visual quality. Only 14 percent of the Forest's potential visual quality objectives would be met.

Big-game population potentials are fourth lowest of all the alternatives as winter ranges are managed for timber production, not to meet big-game management objectives.

b. Analysis of Constraints

PNV = $577,700,000
Opportunity Cost = $27,800,000
Discounted Cost = $436,600,000

The PNV generated by this alternative is $577.7 MM - $27.8 MM less than the Maximum PNV Benchmark and the highest of all alternatives. Timber levels are the highest of any of the alternatives.

PNV was decreased by requiring timber harvest volume in the first decade to be at least 140 MMBF. Because the real stumpage values increase over time more rapidly than the 4 percent discount rate, deferment of harvest is more cost efficient than immediate harvest. The use of the nondeclining yield constraint also reduces the PNV when compared to the Maximum PNV Benchmark.

This alternative has the third highest discounted costs. Achieving a high level of commodity development required a high level of funding in timber and road activities.

c. Net Public Benefits

Alternative 6 would have the most drastic impact on big-game hunting quality. The situation would change significantly from the existing situation. All suitable lands would be accessed and managed for timber, resulting in the highest miles of roads needed for management of all the alternatives. Timber production objectives would preclude management of potential winter range for big game. Potential population levels would be reduced. Unrestricted motorized access would be the highest of all alternatives. The reduced big-game population would be more easily and quickly accessed by hunters. The population structure would probably change from mature branch-antlered animals to younger spike-antlered animals.

Although the distribution of roadless recreation opportunities under this alternative would be good, the quality and variety of the recreation settings would be low. Only nonproductive lands would be managed to provide roadless recreation opportunities, the designation being based on economic criteria rather than evaluation of recreation quality. The diversity of roaded recreation opportunities would be the highest of all alternatives as all suitable Forest lands would be assessed and very few road restrictions imposed.

Alternative 6 would have the same impacts on grizzly bear habitat quality as Alternative 2.

Water quality would have high risk levels due to the timber management activities of this alternative. Watershed impacts would be the greatest of all the alternatives.

Alternative 6 would most adversely impact the visual quality of the Forest. Only 14 percent of the potential visual quality objectives would be met. Highly critical viewing areas would be modified.

Alternative 6 would impact nongame species habitat similarly to Alternative 4.

The variety of plant communities under Alternative 6 would be second highest of all the alternatives due to the large suitable timber base managed for timber production.

Economic stability under Alternative 6 would be adversely affected by the disproportionate emphasis on timber production. Higher timber harvest volumes could create more employment opportunities in the wood products industry; however, the comparatively low production levels of some other resources, particularly big game, would make the wood products industry even more important than it is today, resulting in a potentially more unstable economy.

Under this alternative, existing relationships to the Forest would be altered. High levels of motorized access and a high volume of timber harvest would provide abundant opportunities for fuelwood gathering but would significantly change the visual quality of the Forest landscape. Roadless environments would be roaded over time. The variety of hunting settings would be lowered.

8. ALTERNATIVE 7 (CURRENT DIRECTION)

a. Resource Outputs

The goal of this alternative is to continue current management direction as it is defined by the Ranger District Multiple-Use Plans and the Unit Plans developed for portions of the Forest. This alternative (also referred to as Alternative 7) represents the "no action" alternative.

Timber is emphasized in this alternative, at least in the early decades' volumes. First decade average annual harvest is 132 MMBF, second highest of all the alternatives. The long-term sustained yield of 165 MMBF is fifth highest, reflecting the mix of timber management regimes associated with this alternative that do not allow a higher timber yield to occur within the planning horizon. Current direction continues timber harvest on slopes less than 40 percent in early decades. This results in adverse impacts on nonpriced resources, and lower logging and management costs than other alternatives.

Roadless dispersed recreation management is emphasized on a substantial number of acres; however, the low levels of investment in maintenance of trails, trailhead facilities, and visitor information limit the potential of these acres. Thus, the roadless dispersed recreation potential under this alternative is eighth lowest of all the alternatives. Similarly, this alternative limits potential capacity of the wildernesses due to low levels of funding for management. No new wilderness is recommended.

Visual quality objectives are met on a majority (63 percent) of the acres with potential in retention or partial retention visual quality objectives. Existing management direction, however, does not assure that visual quality is met in critical viewing areas.

Big-game population potentials are relatively high in the first decade because of the timber harvest scheduled on winter ranges. But populations would decline by the fifth decade because production of utilizable forage is not maintained. By Decade 5, winter range forage production is sixth lowest of all the alternatives. Livestock grazing would remain at existing permitted levels, fifth highest of the alternatives.

b. Analysis of Constraints

PNV = $532,700,000
Opportunity Cost = $72,800,000
Discounted Cost = $438,900,000

This alternative achieves a PNV of $532.7 MM, second highest of all the alternatives.

Current Direction has an opportunity cost of almost 73 million dollars. The mix of land designations and funding levels associated with existing management direction are not guided by economic efficiency criteria. A good portion of the opportunity cost is undoubtedly related to the inflexibility of conforming to existing management direction. Compared with other alternatives, the PNV of Current Direction is high because of the relatively low production and reforestation costs in relation to the timber harvest.

The total discounted costs for this alternative are the second highest of all the alternatives. Logging, timber, and road costs are high for this alternative. These activities and costs would be necessary to implement to achieve the high level of timber harvest programed for this alternative.

c. Net Public Benefits

Current Direction would alter the quality of big-game hunting over time. The high level of roading needed for management would be located throughout the Forest providing relatively unrestricted motorized access. By the fifth decade, few unroaded areas would remain and access during hunting season would have increased. The potential elk, mule deer, and whitetailed deer populations in the first and second decade are relatively high because timber harvest sustains high levels of forage production. But by the fifth decade, management designed to increase forage production on only 50 to 60 percent of the potential winter ranges would result in populations lower than under other alternatives. The variety of environmental settings would be reduced over time, with hunting outside wilderness generally occurring in a roaded environment.

Although total acreage managed to provide dispersed recreation opportunities is high, low funding levels and the lack of consistent direction limit the quality of the dispersed recreation. Few primitive roadless recreation areas are provided. The productive lands in the north end, the Swan Range, Glacier Slough, and the Spotted Bear River would be accessed and managed for timber. Lands actually designated as roadless dispersed recreation management would not be in high quality settings, nor would there be a variety of settings.

Current Direction would have the same impact on grizzly bear habitat as Alternative 2.

Watershed risk would be slightly higher than under the Preferred Alternative in the first decade, and would increase to the level associated with Alternative 2.

Although Current Direction meets a relatively high percentage of the Forest's potential visual quality objectives, the management objectives and land designations do not assure that the visual quality of highly critical areas is retained. The landscape of the Forest would be natural appearing where less frequently seen and modified where frequently seen.

Current Direction generally would have a negative effect on some nongame species habitats. The acres contributing old-growth habitat would be the fewest of all the alternatives. No areas would be managed specifically to improve or maintain nongame species habitat. General forest and tree dependent species as well as grass, forb, and shrub users would have increased amounts of habitat.

Current Direction would provide the greatest potential over the long term to maintain a variety of plant communities. Higher funding levels associated with the timber management program would provide opportunities to maintain varied timber species and age classes throughout the suitable land base.

Current Direction would generally maintain the existing level of economic stability over the short term. Over time, however, increases in timber production levels and reductions in the quality and amount of recreation and hunting opportunities would slightly degrade local economic stability because more emphasis would be placed on a single industry.

Existing relationships to the Forest would be maintained for the first decade but would be changed by the second and third decades. Motorized access to the Forest would increase over time, affording local residents more opportunities to gather firewood and pursue motorized recreational activities. Unroaded environments would be reduced. The visual quality of the Forest would be modified.

9. ALTERNATIVE 8

a. Resource Outputs

The goal of this alternative is very similar to Alternative 3; that is to provide a level of timber harvest to local mills that is consistent with recent harvest levels while at the same time responding to the growing recreational use of the Flathead Valley. This alternative also focuses on maintaining a pleasant setting but to a lesser extent than Alternative 3. Timber harvest activities would be allowed to occur in frequently seen areas, but they would be designed to minimize the impact on the view. This alternative emphasizes achieving a recovered population of grizzly bears.

Alternative 8 reduces the restrictive visual quality objectives from 89 percent of the potential level to 75 percent. Alternative 8 has the fourth highest visual quality objectives of all the alternatives, making timber management more costly.

All types of recreation opportunities are emphasized.

This alternative focuses roadless dispersed recreation management on areas with identified high recreation values. It also provides for high management funding for recreation areas, increasing the number of opportunities available from a given area. Wilderness and developed recreation site management is conducted more intensively and with higher funding levels to improve the quality of the recreation opportunities. No addition to the existing National Wilderness Preservation System is recommended.

Timber management objectives are similar to Alternative 3. The first decade harvest level (100 MMBF) is consistent with the Forest's average harvest volumes of the last 10 years. The long-term sustained yield of the Preferred Alternative is 1 MMBF less than Alternative 3.

The slight reduction in long-term sustained yield could be the result of about 94,000 acres being managed to meet grizzly bear habitat management objectives. Timber harvest would occur but would be designed to meet grizzly bear objectives, not high timber production objectives. The 200-bear habitat potential provided by this designation of acres meets the intent of the Grizzly Bear Recovery Plan.

Big-game populations are lower than several other alternatives until the fifth decade, when they rise above Current Direction and Alternative 5 to be third highest of all the alternatives. Road access restrictions and the big-game population levels combine to provide a high level of hunting opportunities that is similar to Alternative 3. Livestock grazing opportunities would be the same as under Alternative 3 and moderate in the range of alternatives.

b. Analysis of Constraints

PNV = $492,800,000
Opportunity Cost = $112,700,000
Discounted Cost = $424,600,000

The PNV achieved is $492.8 MM, ranking sixth lowest of the 17 alternatives.

Alternative 8 provides the recreation opportunities missing in Alternative 4, but the PNV remains similar due to the addition of costs associated with visual quality objectives and acres managed to improve grizzly bear habitat. Alternative 8 has an opportunity cost of 112.7 million dollars.

The Decade 1 harvest level of 100 MMBF/year is further constrained in comparison to the Maximum PNV Benchmark to minimize environmental effects due to distribution of the harvest. Timber harvest is constrained by grizzly habitat management objectives on approximately 30,000 suitable acres, visual quality objectives on approximatley 10,000 acres, big-game winter range management on about 50,000 acres, and riparian management on 9,000 suitable acres. These acres are all considerably higher than the PNV benchmark and results in a tradeoff of PNV.

c. Net Public Benefits

Alternative 8 generally would maintain the quality of big-game hunting producing the same long term effects as Alternative 3.

This alternative would be similar to Alternative 3 in that dispersed recreation opportunities would be provided throughout the Forest. The north end of Glacier View Ranger District would be managed to improve grizzly bear habitat; however, the existing unroaded acres of concern--Spotted Bear River, Glacier Slough and the Swan Range--would be managed to provide roadless recreation opportunities. Variety and quality of the roadless recreation setting would be high. Roaded recreation opportunities would be restricted by the road management program.

Alternative 8 would meet the intent of the Grizzly Bear Recovery Plan through a mix of land designations and management objectives that would protect grizzly bear habitat and provide the opportunity to attain a recovered population. A high proportion of the highly productive grizzly bear habitat would be managed to maintain and improve the important habitat components. Security would be provided for grizzly bears and gray wolf populations.

Watershed risk under Alternative 8 would be similar to Alternative 3.

Under Alternative 8, the visual quality of the Forest would be improved over the existing situation and all other alternatives except Alternative 3. Potential visual quality objectives are met in highly critical areas and important recreational areas.

Nongame species habitat would be protected and moderately enhanced. The effects of the alternative would be very similar to Alternative 3.

Plant community composition and variety under this alternative would also be similar to Alternative 3. Variety would improve over the existing situation, generally through timber harvest, and grizzly bear habitat management would provide opportunities to use fire to manipulate vegetation. Plant communities in areas where timber harvest would not be compatible with management objectives would advance to the later successional stages.

The effect on economic stability would be very similar to Alternative 3.

Impacts on lifestyles would be similar to Alternative 3. This alternative would provide the most well-rounded response to local residents' land-use patterns.

10. ALTERNATIVE 9

a. Resource Outputs

This alternative has resource objectives designed to maximize the wilderness resource, and to provide the greatest amount of revenue for the least cost on nonwilderness lands. Commodity resources management is guided primarily by economic criteria. Management for resources that do not produce revenue outside wilderness is minimal.

This alternative schedules timber harvest to ensure that maximum value is returned to the Federal Treasury. Therefore, because of the existing timber age class distribution and higher value associated with larger diameter timber on the Forest, much of the harvest is delayed until the fifth decade. The average annual programed harvest of timber for the first decade is 103 MMBF, and peaks at 146 MMBF in Decade 5. The long-term sustained yield capacity of 129.2 MMBF is lowest of all alternatives.

Viewing quality is not emphasized because maintenance of a pleasing landscape increases management costs. Similarly, other constraints and land uses which increase costs and reduce timber revenues such as big-game winter range, grizzly habitat, and amenity values are minimized in the remaining nonwilderness portion of the Forest.

Investment of funds for management of roadless dispersed recreation occurs primarily in those areas which are not capable of timber management and less than 5,000 acres in size. Alternative 9 adds 495,000 acres to the existing National Wilderness Preservation System. Over 67 percent of the Forest would be classified as wilderness, the most of any alternative. All existing contiguous roadless areas of 5,000 acres or more are designated wilderness. Recreation opportunities would consist primarily of primitive dispersed in wilderness areas, and roaded natural-appearing in nonwilderness. Semiprimitive motorized and nonmotorized opportunities would be limited.

Alternative 9 managed all 1,565,300 acres of wilderness at high intensity and provides an estimate of the maximum amount of wilderness recreation the Forest could provide. Wilderness recreation capacity is 468 MRVD's/year, 58 percent of the projected Decade 5 use of 80 MRVD's/year. Roadless dispersed recreation capacity is 72 MRVD's/year, 20 percent of Decade 5 use projected to be 368 MRVD's/year. Roaded natural-appearing capacity of 944 MRVD's/year, is 77 percent of the 1233 MRVD's/year projected Decade 5 need.

Oil and gas exploration and development in nonwilderness areas under this alternative is less restricted than under other alternatives.

Little active management for wildlife habitat of any species would be provided. Grizzly bear potential habitat to support 212 bears is third highest of the 16 alternatives due to the security provided by the large proportion of the Forest managed as wilderness.

Alternative 9 would make the maximum contribution possible for the Flathead National Forest, by adding 495,000 acres to the existing National Wilderness Preservation System. It would maintain existing commodity outputs near current levels, but future potential to provide commodity and certain noncommodity resources such as semiprimitive dispersed recreation is constrained compared to other alternatives.

b. Analysis of Constraints

PNV = $512,900,000
Opportunity Cost = $92,600,000
Discounted Cost = $331,100,000

Alternative 9 has a PNV of $512.9 MM, the third highest of the 17 alternatives.

Alternative 9 has an opportunity cost of 92.6 million dollars due to 495,000 acres of currently nonwilderness lands being added to the National Wilderness Preservation System. The only change between the PNV Benchmark and Alternative 9 is the assignment of the current roadless inventory to wilderness management. Almost 90 percent of the opportunity cost is due to reduced timber harvest benefits.

Although both PNV Benchmark and Alternative 9 have identical constraints including 80 percent of current timber harvest floor, the maximum wilderness alternative cannot achieve the timber returns of the PNV Benchmark due to the 145,000-acre reduction in the suitable landbase. The change in suitable acres is not equal to the total potentially suitable acres in the roadless inventory because many of those potentially suitable roadless acres were economically unsuitable in the PNV Benchmark.

Alternative 9 has the lowest discounted costs of all the alternatives. With all roadless lands designated as wilderness, capital investment is low. The remaining land is managed as cost efficiently as possible for timber and other priced commodities.

c. Net Public Benefits

Under this Alternative, big-game hunting quality would change slightly from the existing situation. Elk and deer populations would be low by the third and fourth decades due to less forage being available. This would result in lower hunter success. Wilderness would provide a high level of security for big-game animals. Most hunting would take place in a primitive setting.

All areas of high quality primitive recreation would be recommended for wilderness. A wide range of settings, however, would not be provided in this alternative. Primitive recreation settings, both of high and low quality, would be maximized at the expense of existing semiprimitive motorized and semiprimitive nonmotorized settings.

Under Alternative 9, the quality of grizzly bear and gray wolf habitat would increase due to the increase in security. The recovery population for grizzly bears would be met.

Water quality would be comparable to Alternative 8. There would be increased risk of negative water quality impacts due to supporting first decade harvest at comparable levels with a reduced timber land base.

Areas with sensitive visual quality objectives within proposed wilderness areas would be preserved. Visual quality in sensitive areas outside the recommended wilderness areas would have reduced visual quality due to the PNV and timber harvest objectives.

Habitat to support snag cavity and old-growth dependent species would be the third highest of all alternatives. Old growth would be protected by wilderness, but nonwilderness areas would have less old-growth protection than Alternatives 1 and 10. Habitat to support grass, forb, and shrub users would be sufficient to meet viable population requirements.

Over time, the variety of plant communities would be the third lowest of any alternative. Much of the Forest would tend toward climax species since the majority of the Forest would be managed for wilderness.

Employment opportunities would be maintained for this alternative. No growth in the timber industry, however, would occur as future supplies of timber would not increase. Employment associated with wilderness recreation would be the highest of any alternative.

Local resident access to the Forest would be the lowest of any alternative, as would firewood gathering opportunities. This alternative would significantly impact existing land use patterns and lifestyles.

Alternative 9, with all inventoried roadless areas classified as wilderness, would maximize the nonrecreation wilderness values. Areas of both high and low quality for natural integrity, natural appearance, and opportunities for solitude would be included.

11. ALTERNATIVE 10

a. Resource Outputs

This alternative emphasizes protection of areas where roadless and wildlife values are high. Wilderness will be recommended for pristine roadless areas where wilderness attributes are high and widely recognized. Timber production and resource extraction are concentrated in other portions of the Forest because of the importance of the timber industry in the local economy.

Those areas managed as wilderness are the Swan Front, Swan Crest, and the north end of Glacier View Ranger District. These areas correspond to the Montana Wilderness Association's "Alternative W" recommendations of approximately 196,000 acres. In addition, the Le Beau area of the Tally Lake Ranger District and roadless portions of the Spotted Bear Ranger District are managed for primitive recreation, water protection, and wildlife. This alternative provides a large amount of acreage for primitive recreation, old growth, and nongame species habitat. Dispersed recreation objectives for Jewel Basin Hiking Area (included in the Swan Crest) would be replaced by wilderness management objectives providing primitive recreation. Semiprimitive motorized recreation opportunities would be restricted to a few areas.

Average annual timber harvest levels for the first five decades correspond closely to Alternative 1; Decade 1 average annual harvest is 80 MMBF. Timber management is concentrated on the more productive sites where other resource values are not significant (generally those with a potential productivity of 50 cubic feet/acre/year or more). The suitable timberland in this alternative is third lowest of all alternatives. This is because of primary consideration being given to amenity resources. Long-term sustained yield capacity is 142.1 MMBF/year.

All riparian area management emphasizes wildlife and fisheries habitat. All big-game winter range acres are sustained at 95-100 percent of maximum potential with high levels of investment in habitat improvement. Long-term potential elk, mule deer, and whitetailed deer populations are the highest of all the alternatives. Grizzly bear habitat potential is 195 bears; about midrange among the alternatives.

Considering the range of alternatives, Alternative 10 maintains a high level of old-growth habitat on the Forest and in time would provide the best big-game winter range habitat. It emphasizes wilderness management and amenity resources. About 40 percent of the existing roadless areas would be recommended for wilderness. This alternative has a small suitable timberland base and a low long-term sustained yield capacity.

b. Analysis of Constraints

PNV = \$502,200,000
Opportunity Cost = \$103,300,000
Discounted Cost = \$351,000,000

Alternative 10 achieves a PNV of \$502.2 MM, near the midrange of the 17 alternatives.

Alternative 10 has an opportunity cost of 103.3 million dollars. This alternative is exactly the same as Alternative 14 in the lands recommended for wilderness. The nonwilderness lands in Alternative 10 emphasize dispersed recreation and wildlife objectives resulting in 75,000 fewer acres in the suitable timber land base than Alternative 14. This reduces PNV.

Alternative 10 has the third lowest discounted costs. This low level of costs goes along the high amount of recommended wilderness and low level of timber harvest.

c. Net Public Benefits

Under this alternative, the quality of big-game hunting would be maintained, or perhaps slightly increased over time. The majority of existing unroaded areas of the Forest would remain unroaded, providing big-game security from human disturbance and settings for roadless hunting experiences. The miles of road needed for management would be fewer than under other alternatives. Motorized access during hunting season would remain at the existing levels although year-round access would increase slightly. Over time, big-game population levels would be expected to increase as high investments in winter range management are made on over 95 percent of the potentially suitable winter range areas.

Lower timber harvest in the early decades delays increased forage production. Hunters' opportunities for success would remain stable or increase compared to the existing situation. Restrictions on motorized access and winter range management would allow big-game populations to increase.

Alternative 10 would preserve as wilderness the roadless areas which have special recreation and other resource values (including the north end of Glacier View Ranger District, the Swan Front, and Swan Crest). The distribution of semiprimitive roadless opportunities is limited because of the areas of the Forest recommended for wilderness. Roaded recreation opportunities would be limited by the restrictive road management program.

This alternative would provide potential habitat that would allow the grizzly bear and gray wolf to reach recovery populations. Under Alternative 10, highly productive grizzly bear habitat on the Glacier View and Spotted Bear Ranger Districts would be managed to provide roadless dispersed recreation or wilderness opportunities. No additional roads would be constructed, thus security would be maintained. Habitat could, however, change over time and quality could decrease from current levels.

Water quality under Alternative 10 would remain relatively high over the first and second decades; however, localized adverse impacts on fisheries and water-based recreation opportunities would still occur. Although water quality deteriorates, it would remain higher than most other alternatives in the fifth decade. Alternatives 1, 5, 10, and 16 provide the best water quality over the next 50 years.

Under this alternative, a moderate proportion (64 percent) of the potential visual quality objectives would be retained, resulting in a Forest environment with good scenic quality.

Under Alternative 10, nongame species habitat would be emphasized more than under other alternatives due to the protection of large roadless areas and management of riparian areas for wildlife.

Alternative 10 would have the lowest potential for maintaining varied plant communities. This alternative has the third lowest number of acres in the suitable timber land base. Land designations which do not allow timber harvest would provide limited opportunities for the use of fire. Much of the Forest would advance to the later plant successional stages.

Employment opportunities decline in the first decade, particularly in the wood products industry. Potential employment associated with recreation and wilderness opportunities, especially those associated with hunting and fishing, partially offset the decline in economic stability that would result from decreased timber harvest levels.

Alternative 10 would designate for wilderness those areas as having recognized very high quality nonrecreation wilderness values. The Swan Range and the north end of Glacier View Ranger District, which have high nonrecreation wilderness values, would be managed as wilderness.

12. ALTERNATIVE 11

a. Resource Outputs

The goals of Alternative 11 are very similar to Alternative 8; that is to provide a level of timber harvest to local mills that is consistent with recent harvest levels while at the same time responding to the growing recreational use of the Flathead area. Alternative 11 has an additional objective for adding to the Bob Marshall Wilderness. The ID Team recommended that additions to the Bob Marshall Wilderness would include the roadless area portions with the highest quality wilderness attributes and the most manageable boundaries.

The recommended wilderness additions include 5,187 acres in the Limestone Cave area of the East Side South Fork roadless area and 43,667 acres in Swan Front south of Inspiration Point. Other commodity and noncommodity objectives remain the same as Alternative 8.

The first decade timber harvest level is 100 MMBF, increasing by the fifth decade to 157 MMBF. The long-term sustained yield capacity (164 MMBF/year) is slightly less than Current Direction (165 MMBF/year).

All types of recreation opportunities are emphasized. The wildernesses and the Flathead Wild and Scenic River would be managed with higher levels of investment in trail maintenance, access sites, trailhead facilities, and visitor information. Alternative 11 adds the highest quality area to the existing Bob Marshall-Great Bear-Scapegoat Wilderness Complex. High quality dispersed and developed recreation opportunities would be available because of increased investment in recreation facilities. This alternative focuses on balanced multiple-use management, and the addition of areas with high wilderness values and manageable boundaries.

This alternative would provide potential elk, mule deer, and whitetailed deer habitat at the same level as Alternative 8. Important fisheries streams would be managed to protect and improve fisheries habitat. About 94,000 acres of the Forest would be managed to improve grizzly bear habitat as the primary emphasis. This includes a 61,000 acre Trail Creek Grizzly Bear Management Area recommended for special area classification in the north end of the Glacier View Ranger District. This would contribute to grizzly bear and gray wolf recovery, and helps to achieve a 201-bear habitat potential. Furbearers and nongame species are maintained at levels comparable to Alternative 8. Land use patterns combined with habitat and road management practices will provide a desirable mix of wildlife resources on a sustained yield basis. This alternative maintains a pleasant setting in the Flathead Valley.

b. Analysis of Constraints

PNV = $499,400,000
Opportunity Cost = $106,100,000
Discounted Cost = $412,500,000

The PNV achieved is $499.4 MM; ranking eight or the midrange of the alternatives.

Alternative 11 has an opportunity cost of 106.1 million dollars. PNV is relatively low due to increased costs for grizzly bear habitat management and improvement. The additional implementation costs for grizzly bear habitat and other uses such as dispersed recreation account for Alternative 11 being more costly than Alternatives 10, 12, 13, and 14. These alternatives designate significantly more acres in relatively low cost wilderness. The PNV due to recreation benefits changes little by adding acres to the wilderness system until those additions cause the capacity of the Forest to be less than the projected recreation use in early decades.

In addition, PNV is reduced because of visual quality and big-game habitat objectives.

c. Net Public Benefits

Alternative 11 would generally maintain the existing quality of big-game hunting over time. Moderate increases in access would occur at the roads needed for management are constructed. Restrictions on motorized access, however, would be imposed to meet management objectives. Roadless dispersed recreation land designations provide security from human disturbance for big game and an unroaded hunting environment. Management of over 75 percent of the potential winter ranges to improve forage production would increase potential elk, mule deer, and whitetailed deer populations over time. Increased big-game numbers could offset the potential impacts of slightly increased access.

A high level of roaded and roadless dispersed recreation opportunities would be provided throughout the Forest. The north end of Glacier View Ranger District would be managed to improve grizzly bear habitat; however, the existing unroaded areas of concern--Spotted Bear River, Glacier Slough, and the Swan Range--would be managed to provide roadless recreation opportunities. Variety and quality of the roadless recreation setting would be high. Roaded recreation opportunities would be restricted by the road management program.

Alternative 11 would meet the intent of the Grizzly Bear Recovery Plan through a mix of land designations and management objectives that would protect grizzly bear habitat and provide the opportunity to attain a recovered population. Within the Trail Creek Grizzly Bear Management Area a high proportion of the key productive grizzly bear habitat would be protected and managed to maintain and improve the important habitat components of the area. Security would be provided for grizzly bear and gray wolf populations.

Water quality would remain at existing levels. Risks associated with maintaining timber harvest at a level that would not cause unreasonable economic displacement are projected to increase. As a result of the geographic location of economically operable timber stands, timber harvests for Decades 1 and 2 must come from the same drainages as past timber harvest. Recognition of risk areas, attention to good project level management practice and mitigation measures would maintain desirable water quality.

Under Alternative 11, the visual quality of the Forest would be improved over the existing situation and all other alternatives except Alternative 3. Potential visual quality objectives are met in highly critical areas and important recreational areas.

Nongame species habitat is protected and moderately enhanced in Alternative 11. The percentage of Forest lands contributing old growth and snag cavity habitat is moderate in comparison to other alternatives. Other types of habitat to support all nongame species would exist at moderate levels by the end of the fifth decade. Some areas would be managed specifically for nongame species.

The variety of plant communities would improve over the existing situation generally through timber harvest. Those acres on which roadless dispersed recreation opportunities are provided would advance to the later plant successional stages. Grizzly bear habitat would provide opportunities for use of fire in limited areas.

Economic stability would be promoted by Alternative 11, with management emphasis placed on the full array of resources significant to the local economy. Economic growth would be slow but spread throughout important industrial sectors.

This alternative would provide the best opportunities to maintain existing land use patterns and lifestyles. Local residents would be afforded access to the Forest, yet access restrictions would be sufficient to maintain a variety of settings for hunting, fishing, and other activities occurring in a forested environment. Some roadless environments would be maintained. Firewood would continue to be accessible.

Alternative 11 would preserve as wilderness the Swan Front from Inspiration Point south. Also, the Limestone Caves along Spotted Bear River are included. The qualities of natural integrity, natural appearance, and opportunities for solitude are the highest for the Swan Front when compared with the other roadless areas. These additions to the existing Bob Marshall Wilderness ecosystem would result in improved nonrecreation wilderness values.

13. ALTERNATIVE 12

a. Resource Outputs

Alternative 12 is very similar to Alternative 11 except that the recommended wilderness addition to the Bob Marshall consists of a Swan Front addition similar to that proposed by the Montana Wilderness Association (approximately 84,400 acres).

No potentially suitable timber harvest areas were scheduled in early decades in areas added to wilderness. The first decade timber harvest level is 100 MMBF/year, increasing by the fifth decade to 165 MMBF/year. The long-term sustained yield capacity (164 MMBF/year) is slightly less than Current Direction (165 MMBF/year).

All types of recreation opportunities are emphasized. The wildernesses and the Flathead Wild and Scenic River would be managed with higher levels of investment in trail maintenance, access sites, trailhead facilities, and visitor information. This alternative focuses on multiple-use management, and the addition of areas with high wilderness values to the Bob Marshall in the Swan Front. A large proportion of areas designated for roadless dispersed recreation management are not capable of timber production. Therefore, potential competition between providing recreation opportunities and timber volume are minimized. Funding for maintenance of trails and trailhead facilities, visitor services, and trail and facility construction is high. Visual quality and road management is similar to Alternative 11.

This alternative would provide wildlife potentials for all species similar to Alternative 11. Some acres in Bunker Creek planned for active grizzly habitat management in Alternative 11 are managed as wilderness in Alternative 12 resulting in a loss of average long-term habitat potential. That loss is offset by the additional security provided by wilderness management on areas which have projected higher levels of human activities in Alternative 11. Both Alternatives 11 and 12 have a grizzly habitat potential for 201 bears, and feature 61,000 acres in the north end of Glacier View Ranger District as a classified Trail Creek Grizzly Bear Management Area.

b. Analysis of Constraints

PNV = $505,300,000
Opportunity Cost = $100,200,000
Discounted Cost = $411,300,000

This alternative achieves a PNV of $505.3 MM, fourth highest of all the alternatives.

Alternative 12 has an opportunity cost of 100.2 million dollars. The additional $7.6 million dollar reduction in PNV from Alternative 9 is primarily a result of increased costs for meeting higher levels of dispersed recreation use on nonwilderness lands, increased visual landscape management, higher levels of big game and fisheries habitat improvement, grizzly bear habitat improvement, and increased capital investment in Decades 1-4 for roads in order to reduce environmental effects of harvesting on steep lands. PNV is maximized by concentrating harvest on gentle slopes in early decades and delaying high cost logging areas until later decades. PNV decreases when constraints are used which schedule harvesting on steep slopes in early decades. The nonpriced benefits of such constraints are: better diversity and distribution of wildlife habitat and vegetation, improved visual and recreation quality, reduced risk of adverse water quality effects, and better opportunity to distribute harvests in regenerated stands. In addition to increased costs for multiple-use objectives such as recreation, visual quality, and wildlife habitat, constraints on economic harvest of timber are necessary for their achievement. This decreases PNV.

c. Net Public Benefits

Alternative 12 would generally maintain the existing quality of big-game hunting over time. Effects on quality would be the same as in Alternative 11.

A high level of roaded and roadless dispersed recreation opportunities would be provided throughout the Forest. Alternative 12, however, would limit the semiprimitive recreation opportunities as more land in the Swan Range is classified as wilderness. The north end of Glacier View District would be managed to improve grizzly bear habitat in this alternative. The other existing high value roadless areas would be managed to provide a spectrum of roadless recreation opportunities. These areas include the Swan Crest, Deadhorse, Coal Ridge, Standard Peak, Le Beau, and high value areas in the Middle Fork and South Fork.

Alternative 12 would meet the intent of the Grizzly Bear Recovery Plan. This alternative has the same effect on the grizzly as Alternative 11.

Water quality would be similar to Alternative 11.

Under Alternative 12, the visual quality of the Forest would be improved over the existing situation. Potential visual quality objectives are met in highly critical areas and important recreational areas.

Nongame species habitat is protected and moderately enhanced in Alternative 12. The percentage of Forest lands contributing old growth and snag cavity habitat is moderate in comparison to other alternatives. Other types of habitat to support all nongame species would exist at moderate levels by the end of the fifth decade. Some areas would be managed specifically for nongame species.

Economic stability would be provided by this alternative. Economic growth would be slow but distributed throughout important industrial sectors.

Alternative 12 would provide good opportunities to maintain existing land use patterns and lifestyles. Local residents could access the Forest, while access restrictions would be sufficient for resource protection. Most roadless environments would be maintained.

Alternative 12 would add to nonrecreation wilderness values over Alternative 11 by increased acres recommended for wilderness classification in the Swan Range between Sixmile Mountain and Inspiration Point.

14. ALTERNATIVE 13

a. Resource Outputs

The goals and objectives of Alternative 13 are similar to Alternative 12. Alternative 13 has an additional objective of adding substantial wilderness close to population centers. The ID Team recommended that wilderness additions would include the roadless areas with the highest quality wilderness attributes in the Swan Range.

The recommended wilderness addition includes the Swan Front and Swan Crest with boundaries very similar to those proposed by the Montana Wilderness Association for a total of approximately 143,200 acres of new wilderness. Commodity and noncommodity objectives remain the same as Alternative 12.

The first decade timber harvest level is 100 MMBF/year, increasing by the fifth decade to 164 MMBF/year. The long-term sustained yield capacity (162 MMBF/year) is slightly less than Current Direction (165 MMBF/year).

All types of recreation opportunities are emphasized subject to the wilderness objectives. The wildernesses and the Flathead Wild and Scenic River would be managed with higher levels of investment in trail maintenance, access sites, trailhead facilities, and visitor information. Alternative 13 adds the highest quality area to the existing Bob Marshall-Great Bear-Scapegoat Wilderness Complex (Swan Front) and the highest quality area close to population centers (Swan Crest).

Recreation opportunities and potential recreation capacity for the Swan Crest Area would change significantly from the current situation. Roadless dispersed recreation capacity for the Forest is 242 thousand RVD's/year, 66 percent of the 368 MRVD's/year use projected by Decade 5. A large proportion of areas designated for roadless dispersed recreation and wilderness management are not capable of timber production. Therefore, potential competition between providing wilderness and recreation opportunities and timber volume are minimized. Visual quality and road management is similar to Alternative 12.

This alternative would provide potential elk, mule deer, and whitetailed deer habitat at the same level as Alternative 12. Future forage potential is somewhat reduced. The Trail Creek Grizzly Bear Management Area of 61,000 acres would also be featured in this alternative. A slight gain over Alternative 12 in grizzly bear habitat potential is 202 grizzly bears is due to the reduced human activities projected for the Swan Crest Area under wilderness management objectives thus providing greater security.

Alternative 13 would recommend 29 percent of the existing roadless areas to wilderness while maintaining timber harvest near present levels.

b. Analysis of Constraints

PNV = $504,400,000
Opportunity Cost = $101,100,000
Discounted Cost = $405,900,000

The PNV of this alternative is $504.4, fifth highest of all the alternatives.

Alternative 13 has an opportunity cost of 101.1 million dollars. The additional $900,000 reduction of PNV from Alternative 12 is due to the reduction in recreation carrying capacity and recreation PNV by adding approximately 60,000 acres of the Swan Crest to wilderness. Even though wilderness RVD's are valued higher than roadless dispersed RVD's, the change in capacity from a nonwilderness dispersed recreation to wilderness results in lower PNV. The timber harvest schedule and resulting contribution to PNV is little changed from Alternative 12 due to the relatively small change in the suitable land base and lack of early timber harvest in added areas.

c. Net Public Benefits

Alternative 13 would generally maintain the existing quality of big-game hunting over time. Effects on quality would be the same as in Alternative 12.

Roadless dispersed recreation opportunities would be somewhat limited in availability and distribution.

Alternative 13 would limit the semiprimitive recreation opportunities as more land in the Swan Range including the Swan Crest is classified as wilderness. The north end of Glacier View District would be managed to improve grizzly bear habitat in Alternative 13. Dispersed recreation is not emphasized in grizzly bear habitat management. The other existing high value roadless areas would be managed to provide a spectrum of roadless recreation opportunities. These areas include the Deadhorse, Coal Ridge, Standard Peak, Le Beau, and high value areas in the Middle Fork and South Fork.

Alternative 13 would meet the intent of the Grizzly Bear Recovery Plan. This alternative has a similar overall effect on the grizzly bear as Alternative 11. A slight improvement in the grizzly bear potential index reflects a projected reduction in human activities in the Swan Crest area as a result of wilderness designation.

Water quality would be similar to Alternative 11.

Under Alternative 13, the visual quality of the Forest would be improved over the existing situation. Potential visual quality objectives are met in highly critical areas and important recreational areas. These areas would be similar to those protected in Alternative 12.

Nongame species habitat is protected and moderately enhanced in Alternative 13. The percentage of Forest lands contributing old growth and snag cavity habitat is moderate in comparison to other alternatives. Other types of habitat to support all nongame species would exist at moderate levels by the end of the fifth decade. Some areas would be managed specifically for nongame species. Examples include riparian areas and areas such as in Canyon Creek on the Glacier View Ranger District.

Economic stability would be provided by this alternative. Economic growth would be slow but distributed throughout important industrial sectors. The potential future growth would be slightly less than Alternative 12 due to the reduction in the suitable timber base.

Alternative 13 would provide reduced opportunities to maintain existing land use patterns and lifestyles. Traditional access by local residents for motorized recreation in the Swan Crest area would be restricted. Access restrictions would be sufficient for resource protection. High value roadless environments would be maintained or preserved.

Alternative 13 would add to recreation wilderness values over Alternative 12 by increased acres recommended for classification in the Swan Crest from Sixmile Mountain to Columbia Mountain.

15. ALTERNATIVE 14

a. Resource Outputs

The goals and objectives of Alternative 14 are similar to Alternative 13. Alternative 14 has an additional objective of adding a significant amount of wilderness while maintaining or increasing commodity and other outputs on the nonwilderness portion of the Forest. The ID Team recommended that wilderness additions would include the roadless areas with the highest quality wilderness attributes and would include more than just additions to the Bob Marshall-Great Bear-Scapegoat Complex on the Flathead National Forest.

The recommended wilderness additions resulting from the objectives closely approximates the areas recommended by the Montana Wilderness Association's "Alternative W." These areas consist of the best wilderness attributes in the Swan Range (Swan Front and Swan Crest) and the north end of Glacier View Ranger District for a total of approximately 196,600 acres of new wilderness. Commodity and noncommodity objectives remain the same as Alternative 8.

The first decade timber harvest level is 100 MMBF/year, increasing by the fifth decade to 160 MMBF/year. The long-term sustained yield capacity (159 MMBF/year) is slightly less than Current Direction (165 MMBF/year).

Short-term effects on timber of significant wilderness additions can be mitigated. Long-term effects, indicated by the long-term sustained yield capacity, cannot be mitigated at present. Additional mitigation may be possible in the future if practices such as fertilization and use of genetically improved tree stock is proven practical and approved for long-term planning projections.

All types of recreation opportunities are emphasized subject to meeting wilderness and commodity. objectives. Effects on recreation opportunities and capacities are similar to Alternative 13. Since there is a limited land base suitable for providing semiprimitive roadless dispersed recreation opportunities the change in recreation opportunities and potentials due to adding significant wilderness cannot be mitigated. Alternative 14 provides a roadless dispersed potential of 240 MRVD's/year, 65 percent of Decade 5 projected use. Wilderness capacity of 379 MRVD's/year is 47 percent of projected Decade 5 use.

This alternative would provide potential elk, mule deer, and whitetailed deer habitat at the same level as Alternative 8. Because very little critical winter range is within areas recommended in significant wilderness additions, big-game winter range forage can be mostly mitigated. Future forage potential is somewhat reduced. Potential grizzly habitat for 202 bears is similar to Alternative 13. The proposed Trail Creek Grizzly Bear Management Area in Alternatives 11-13, would be replaced by wilderness management in this alternative. About 32,000 acres of the Forest would be managed to improve grizzly bear habitat. Furbearers and nongame species are maintained at levels comparable to Alternative 8.

Alternative 14 would recommend 40 percent of the existing roadless areas to wilderness while maintaining commodity and other outputs on the nonwilderness portion of the Forest.

b. Analysis of Constraints

PNV = $503,000,000
Opportunity Cost = $102,500,000
Discounted Cost = $399,400,000

The PNV achieved by Alternative 14 is $503.0 MM, sixth highest of all the alternatives.

Alternative 14 has an opportunity cost of 102.5 million dollars. The additional 1.4 million dollar reduction in PNV from Alternative 13 is due to additional suitable timberland going to wilderness resulting in reduced timber benefits over the planning horizon. The timber harvest schedule and resulting contribution to PNV is little changed from Alternative 13 because the additions to the wilderness had no harvest scheduled in Decade 1, and very limited future harvests scheduled in grizzly bear habitat which is wilderness in this alternative.

c. Net Public Benefits

Alternative 14 would generally maintain the existing quality of big-game hunting over time. Hunting opportunities would be changed from the existing situation due to the amount of forest with restricted motorized access.

Roadless dispersed recreation opportunities would be similar to that of Alternative 13. The north end of Glacier View Ranger District would be managed as wilderness in this alternative. The other existing high value roadless areas would be managed to provide a spectrum of roadless recreation opportunities. These areas include the Deadhorse, Coal Ridge, Standard Peak, Le Beau, and high value areas in the Middle Fork and South Fork.

Alternative 14 would meet the intent of the Grizzly Bear Recovery Plan. This alternative would feature natural processes of wilderness management rather than an active grizzly habitat program in the north end of Glacier View Ranger District.

Water quality would be similar to Alternative 11.

Under Alternative 14, the visual quality of the Forest would be improved over the existing situation. Potential visual quality objectives are met in highly critical areas and in important recreational areas. These areas are similar to those in Alternative 13.

Nongame species habitat is protected and moderately enhanced in Alternative 14. The percentage of Forest lands contributing old growth and snag cavity habitat increases significantly over Alternative 13 due to the amount of potentially suitable timberland recommended for wilderness. Other types of habitat to support all nongame species would exist at moderate levels by the end of the fifth decade. Some areas would be managed specifically for nongame species in riparian areas.

Economic stability would be provided by this alternative. Economic growth would be slow and the future potential would be less than Alternative 13 due to the reduced timberbase and reduced recreation opportunities and capacity.

Alternative 14 would provide reduced opportunities to maintain existing land use patterns and lifestyles. Local residents traditional access to the Swan Crest area would be restricted to primitive means as in Alternative 13. High value roadless environments would be maintained or preserved.

Alternative 14 would add to recreation wilderness values over Alternative 13 by increased acres recommended for classification in the Mt. Hefty, Tuchuck, and in the Thompson Seton roadless areas.

16. ALTERNATIVE 15

a. Resource Outputs

The goals and objectives of Alternative 15 are similar to Alternative 14. Alternative 15 has an additional objective of adding substantial wilderness acres to the National Wilderness Preservation System. The ID Team recommended that wilderness additions would include the roadless areas with the highest quality wilderness attributes and would include additions to the Bob Marshall-Great Bear-Scapegoat Complex in several drainages of the Flathead National Forest plus an expanded north end wilderness.

The recommended wilderness addition includes the areas recommended by the Montana Wilderness Association's "Alternative W" plus portions of roadless areas along the Spotted Bear River, the Middle Fork of the Flathead River, the South Fork of the Flathead River, and the Young-Nasukoin portion of the Thompson Seton roadless area for a total of 260,200 acres of new wilderness. Commodity and noncommodity objectives remain the same as Alternative 8.

The first decade timber harvest level is 100 MMBF/year, increasing by the fifth decade to 156 MMBF/year. The long-term sustained yield capacity (154 MMBF/year) is less than Current Direction (165 MMBF/year). Decade 1 timber harvest outputs are maintained but Decade 3 and beyond has reduced timber harvest.

All types of recreation opportunities are emphasized subject to meeting wilderness objectives. The wildernesses and the Flathead Wild and Scenic River would be managed with higher levels of investment in trail maintenance, access sites, trailhead facilities, and visitor information. Wilderness capacity is 398 MRVD's/year, 49 percent of Decade 5 projected use. Alternative 15 provides a roadless dispersed potential of 199 MRVD's/year, 54 percent of Decade 5 projected use. Roaded natural-appearing dispersed recreation potential is 1,189 MRVD's/year, 96 percent of Decade 5 projected use.

This alternative would provide potential elk, mule deer, and whitetailed deer habitat at the same level as Alternative 8. Future forage potential is somewhat reduced. Road access to the Forest would be slightly more restrictive. Important fisheries streams would be managed to protect and improve fisheries habitat.

About 20,600 acres of the Forest would be managed to improve grizzly bear habitat, but would not receive formal classification. Additional security provided by wilderness in place of multiple-use areas balances the change in long-term potential where wilderness is substituted for active bear habitat maintenance and improvement. As a result, bear habitat potential is 202 bears similar to Alternatives 13 and 14. Furbearers and nongame species are maintained at levels comparable to Alternative 8.

Alternative 15 would recommend 53 percent of the existing roadless areas to wilderness.

b. Analysis of Constraints

PNV = $497,700,000
Opportunity Cost = $107,800,000
Discounted Cost = $389,400,000

The PNV of this alternative is $497.7 MM.

Alternative 15 has an opportunity cost of 107.8 million dollars. The reduction in PNV of 5.3 million dollars from Alternative 14 is due to a combination of reduced recreational capacity, for dispersed recreation, and reduced PNV resulting from less timber benefits due to a reduced suitable timber base. The opportunity cost reflects a value for the gain in nonpriced wilderness benefits resulting from the inclusion of over half the current roadless acres, with the highest wilderness values, into the wilderness system.

Reduced recreational carrying capacities also reduce net value because projected dispersed recreation use for all categories exceeds the capacity of the Forest.

c. Net Public Benefits

Alternative 15 would generally maintain the existing quality of big-game hunting over the short range. Long-term big-game potential would be somewhat reduced from Alternative 14. Hunting opportunity would be changed from the existing situation due to the amount of the forest with restricted motorized access.

Roadless dispersed recreation opportunities would be reduced from Alternative 14. Alternative 15 would limit the semiprimitive recreation opportunities more than Alternative 14 by designating additional wilderness in the Slippery Bill and Spotted Bear River areas. The north end of Glacier View Ranger District would be managed as wilderness to a greater degree than Alternative 14 with additional wilderness designation in the Young-Nasukoin area of the Thompson Seton roadless area. The other existing high value roadless areas would be managed to provide a spectrum of roadless recreation opportunities. These areas include Deadhorse, Coal Ridge, Standard Peak, Le Beau, and high value areas in the Middle Fork and South Fork.

Alternative 15 would meet the intent of the Grizzly Bear Recovery Plan. This alternative has the same effect on the grizzly as Alternative 14.

Water quality would be similar to Alternative 11.

Under Alternative 15, the visual quality of the Forest would be improved over the existing situation. Potential visual quality objectives are met in highly critical areas and in important recreational areas. These areas are similar to those in Alternative 14.

Nongame species habitat is protected and moderately enhanced in Alternative 15. The percentage of Forest lands contributing old growth and snag cavity habitat is high in comparison to other alternatives. Other types of habitat to support all nongame species would exist at moderate levels by the end of the fifth decade. Some areas would be managed specifically for nongame species in riparian and amenity value areas, such as Canyon Creek and East Shore, Flathead Lake area.

Economic stability would be provided by this alternative. Economic growth would be slow and the future potential would be reduced from Alternative 14 due to the reduced timberbase and reduced recreation capacity and opportunities.

Alternative 15 would provide reduced opportunities to maintain existing land-use patterns and lifestyles. Motorized access to the Forest would be reduced in traditionally used areas such as the Swan Crest and Slippery Bill areas. Most roadless environments would be maintained.

Alternative 15 would add to recreation wilderness values over Alternative 14 by increased acres recommended for classification in the Spotted Bear River, Slippery Bill Mountain and Young-Nasukoin areas.

17. ALTERNATIVE 16

a. Resource Outputs

This alternative focuses on "amenity resources" while designating 76 percent of existing roadless lands as wilderness. It emphasizes management of prime grizzly bear habitat in nonwilderness areas through access restrictions, prescribed burning, and some carefully designated timber harvest to maintain the best relationship of cover to forage. The alternative provides an opportunity similar to Alternative 1 for the Forest to make a significant contribution to the recovered population of grizzly bears, by providing and maintaining habitat to support approximately 216 bears. The gray wolf population also is expected to increase in this alternative due to the extensive security provided by the grizzly habitat emphasis in the nonwilderness portion of the Forest along with approximately 373,800 of new wilderness.

Commodity resource development is not highlighted in this alternative. Timber harvest provides an annual harvest of 71 MMBF/year in the first decade, second lowest of all the alternatives. The harvest level results from primary consideration being given to amenity resources including wilderness. The long-term sustained yield capacity (334.7 MMBF/year) is second lowest of all alternatives. Permitted domestic livestock use is similar to Alternative 1. Oil and gas exploration and development generally is permitted throughout the nonwilderness portion of the Forest but is subject to numerous stipulations designed to protect the surface resource values.

Alternative 16 provides the second highest potential to meet wilderness use needs by providing a potential of 432 MRVD's/year; 53 percent of projected Decade 5 use. Roadless dispersed recreation potential of 112 MRVD's/year can accommodate 30 percent of projected Decade 5 use. Roaded natural-appearing dispersed recreation potential of 1010 MRVD's/year meets 82 percent of projected Decade 5 use. More funding is available for management of the wilderness resource to allow for protection and mitigation of the impacts associated with recreational use. Trail maintenance and visitor information are improved. For similar reasons, the Flathead Wild and Scenic River, campgrounds and picnic areas are managed with higher funding levels.

Big game populations are of concern in this alternative; however, opportunities to manipulate the vegetation to achieve the desired cover/forage ratio are limited by conflicts in some areas with management of grizzly bear habitat and with wilderness designations. Thus, the Forest's potential to support big-game populations is reduced, and is second lowest of all the alternatives by the fifth decade.

In the range of alternatives considered, Alternative 16 provides the best opportunities to contribute to recovered population of grizzly bears, high quality water, quality recreational fisheries, and the third highest number of acres in old growth. This alternative allows livestock grazing at low levels similar to Alternative 1, and has the second lowest long-term sustained yield capacity.

b. Analysis of Constraints

PNV = $466,800,000
Opportunity Cost = $138,700,000
Discounted Cost = $335,400,000

Alternative 16 achieves a PNV of $466.8 MM, lowest of all the alternatives.

Alternative 16 has an opportunity cost of 138.7 million dollars. This is the highest opportunity cost of all alternatives. In addition to further reduced recreation carrying capacity and reduced suitable timber base from Alternative 15, this alternative has additional constraints on timber harvest and costs for grizzly bear habitat maintenance and improvement. Timber harvest is low for this alternative, thus reducing PNV.

Alternative 16 has the second lowest discounted costs. This low level of investment resulted in the lowest discounted benefits, thus giving Alternative 16 the lowest PNV of all the alternatives.

c. Net Public Benefits

Alternative 16 would have the highest security for big-game animals of all alternatives. This is a result of high wilderness designations along with maximum access restrictions due to grizzly bear emphasis. Due to the small percentage, however, of potential winter range that is managed as winter range, potential for deer and elk habitat production by Decade 5 is lowest of all alternatives. Natural succession in wilderness winter range would reduce forage production.

Nearly all the high quality roadless recreation areas would be recommended for wilderness. Only the Le Beau area would provide for a primitive recreation opportunity outside wilderness. Semiprimitive nonmotorized and semiprimitive motorized opportunities would be very restricted.

Acres of threatened and endangered species habitat are highest of all alternatives. A substantial number of acres of management Situation 1 habitat outside wilderness designations are managed to emphasize grizzly bear and gray wolf habitat. Alternatives 1 and 16 provide the highest potential for grizzly bear population density of all the alternatives.

Water quality would be improved over current levels due to reductions in timber harvest and associated road construction and maintenance activities. Alternative 16 offers the second lowest potential to negatively affect long-term water quality.

Alternative 16 has a small amount of total area designated as the visual quality objectives of retention or partial retention. All critical viewing areas are protected, however, either through specific designations for visual quality or through wilderness or roadless designations.

Acres of habitat needed to support snag cavity and old growth dependent wildlife species would be very high. Only Alternatives 5 and 10 exceed Alternative 16 in potential for old growth species. Old growth is preserved through roadless, wilderness, amenity values, and riparian designations.

Only Alternative 10 has lower potential for plant and animal diversity. The amount of land is limited in which timber harvest and fire is used to introduce and maintain vegetation variety.

Economic stability would be adversely affected in Decade 1 due to substantial reductions in timber harvest levels. Potential employment associated with wilderness, recreation, and threatened and endangered species would not offset the employment and income provided by the woods products industry.

As a result of economic and land use changes in Alternative 16, local life styles would be affected. Firewood and other activities, such as berry picking, trail bike riding, and snowmobiling would be significantly reduced from current levels.

Alternative 16 recommends all Flathead National Forest inventoried roadless areas for wilderness except the Le Beau, Standard Peak, Coal Ridge, Swan Island, part of the Middle Fork Flathead adjacent to the Lewis and Clark National Forest, and the lower elevation fringe areas of the Swan Crest. This includes all roadless areas except the areas having the least public support and the lowest wilderness values for wilderness recommendation. Most of the nonrecreation wilderness values are preserved and only Alternative 9 would provide more than this alternative.

18. ALTERNATIVE 17 (PREFERRED ALTERNATIVE)

a. Resource Outputs

The goals of the Preferred Alternative are very similar to Alternative 8; that is to provide a level of timber harvest to local mills that is consistent with recent harvest levels while at the same time responding to the growing recreational use of the Flathead area. Alternative 17 has an additional objective for adding to the Bob Marshall Wilderness and high quality wilderness in the Jewel Basin area of the Swan Mountains. The ID Team recommended that additions to the Bob Marshall Wilderness would include the roadless area portions with the highest quality wilderness attributes and the most manageable boundaries.

The recommended Bob Marshall Wilderness additions includes 5,187 acres in the Limestone Cave area of the East Side South Fork roadless area, and 54,815 acres in Swan Front and Bunker Creek area. The Jewel Basin area recommended for wilderness classification is approximately 31,783 acres, and 6,295 acres is recommended for addition to the Great Bear in the Slippery Bill Mountain area. Other commodity and noncommodity objectives remain the same as Alternative 8.

The first decade timber harvest level is 100 MMBF, increasing by the fifth decade to 156 MMBF. The long-term sustained yield capacity (149 MMBF/year) is less than Current Direction (165 MMBF/year).

All types of recreation opportunities are emphasized. The wildernesses and the Flathead Wild and Scenic River would be managed with higher levels of investment in trail maintenance, access sites, trailhead facilities, and visitor information. Alternative 17 adds the highest quality areas to the existing Bob Marshall-Great Bear-Scapegoat Wilderness Complex. High quality dispersed and developed recreation opportunities would be available because of increased investment in recreation facilities. This alternative focuses on balanced multiple-use management, and the addition of areas with high wilderness values and manageable boundaries.

This alternative would provide potential elk, mule deer, and whitetailed deer habitat at the same level as Alternative 8. Important fisheries streams would be managed to protect and improve fisheries habitat. About 99,000 acres of the Forest would be managed to improve grizzly bear habitat as the primary emphasis. This includes a 77,000 acre Trail Creek Grizzly Bear Management Area recommended for special area classification in the north end of the Glacier View Ranger District. This would contribute to grizzly bear and gray wolf recovery, and helps to achieve a 205-bear habitat potential. Furbearers and nongame species are maintained at levels comparable to Alternative 8. Land use patterns combined with habitat and road management practices will provide a desirable mix of wildlife resources on a sustained yield basis. This alternative maintains a pleasant setting in the Flathead Valley.

b. Analysis of Constraints

PNV = $483,000,000
Opportunity Cost = $123,000,000
Discounted Cost = $401,200,000

Alternative 17 (Preferred Alternative) has a PNV of $483.0 MM, which ranks third lowest of the 17 alternatives. PNV is relatively low due to increased costs for grizzly bear habitat management and improvement. The additional implementation costs for grizzly bear habitat and other uses such as dispersed recreation account for Alternative 17 being more costly than Alternative 10, 11, 12, 13, and 14. These alternatives designate significantly more acres in relatively low cost wilderness. The PNV due to recreation benefits changes little by adding acres to the wilderness system until these additions cause the capacity of the Forest to be less than the projected recreation use in early decades. Alternative 17 is constrained to harvest more acres of lodgepole pine than scheduled by other alternatives and the PNV Benchmark due to predicted losses of merchantable volume due to mountain pine beetle. This results in a tradeoff of PNV because more profit can be made logging longer more valuable mixed species of trees.

c. Net Public Benefits

Alternative 17 would improve the existing quality of big-game hunting over time. Moderate decreases in access would occur at the roads needed for management are constructed and managed to meet management objectives. Roadless dispersed recreation land designations provide security from human disturbance for big game and an unroaded hunting environment. Management of over 95 percent of the potential winter ranges to improve forage production would increase potential elk, mule deer, and whitetailed deer populations over time. Increased big-game numbers could offset the potential impacts of slightly increased access.

A high level of roaded and roadless dispersed recreation opportunities would be provided throughout the Forest. The north end of Glacier View Ranger District would be managed to improve grizzly bear habitat; however, the existing unroaded areas of concern--Spotted Bear River, Glacier Slough and the Swan Range--would be managed to provide roadless recreation opportunities. Variety and quality of the roadless recreation setting would be high. Roaded recreation opportunities would be restricted by the road management program.

Alternative 17 would meet the intent of the Grizzly Bear Recovery Plan through a mix of land prescriptions and management objectives that would protect grizzly bear habitat and provide the opportunity to attain a recovered population. Within the Trail Creek Grizzly Bear Management Area a high proportion of the key productive grizzly bear habitat would be protected and managed to maintain and improve the important habitat components of the area. Security would be provided for grizzly bear and gray wolf populations.

Water quality would remain at existing levels. Risks associated with maintaining timber harvest at a level that would not cause unreasonable economic displacement are projected to increase. As a result of the geographic location of economically operable timber stands, timber harvests for Decades 1 and 2 must come from the same drainages as past timber harvest. Recognition of risk areas, attention to good project level management practice and mitigation measures would maintain desirable water quality.

Under Alternative 17, the visual quality of the Forest would be improved over the existing situation and all other alternatives except Alternative 3. Potential visual quality objectives are met in highly critical areas and important recreational areas.

Nongame species habitat is protected and enhanced in Alternative 17. The percentage of Forest lands contributing old growth and snag cavity habitat is high in comparison to other alternatives. Other types of habitat to support all nongame species would exist at moderate levels by the end of the fifth decade. Some areas would be managed specifically for nongame species.

The variety of plant communities would improve over the existing situation generally through timber harvest. Those acres on which roadless dispersed recreation opportunities are provided would advance to the later plant successional stages. Grizzly bear habitat would provide opportunities for use of fire in limited areas.

Economic stability would be promoted by Alternative 17, with management emphasis placed on the full array of resources significant to the local economy. Economic growth would be slow but spread throughout important industrial sectors.

This alternative would provide the best opportunities to maintain existing land use patterns and lifestyles. Local residents would be afforded access to the Forest, yet access restrictions would be sufficient to maintain a variety of settings for hunting, fishing, and other activities occurring in a forested environment. Some roadless environments would be maintained. Firewood would continue to be accessible. Wilderness resources and recreation opportunities will increase.

Alternative 17 would preserve as wilderness the Jewel Basin area, the Swan Front from Inspiration Point south, and part of the Bunker Creek area. Also, the Limestone Caves along Spotted Bear River and the Slippery Bill Mountain area are included. The qualities of natural integrity, natural appearance, and opportunities for solitude are the highest for the Swan Front when compared with the other roadless areas. These additions to the existing Bob Marshall Wilderness ecosystem would result in improved nonrecreation wilderness values.

D. SENSITIVITY ANALYSIS

In response to questions raised during public review of the DEIS, management wanted to know what effect changes in economic assumptions would have on the FORPLAN analysis data. The primary area of concern is the relative proportion of the tentatively suitable timberlands that are economically suitable.

This section summarizes the analysis to test the sensitivity of the FORPLAN model to changes in the data and assumptions that were used in the benchmark and alternative development and evaluation process. Additional details are available in the planning records. The purpose of this section is to quantify the effect of data changes on the analysis and to display and interpret the implication of the changes for consideration by the responsible official in the decision-making process. The data and assumptions tested, those that had public concerns expressed about their effect on suitable timberlands, are:

-- Timber Utilization Standards
-- Future Timber Price and Production Cost Trends
-- Updated Costs and Timber Value Data
-- Departure From the Preferred Alternative Base Sale Schedule

1. TIMBER UTILIZATION STANDARDS

What are the effects of the new utilization standards specified by the Northern Regional Guide vs. the "old" utilization standards? This question was raised as a result of the Regional planning process and the adoption of the R-1 standards. These standards lowered the minimum diameters of trees considered merchantable by 1 inch and the minimum useable top diameter inside bark by 1 inch.

All benchmarks and alternatives were computed with timber volume tables compiled on the basis of the Northern Regional Guide utilization standards. To test the effect of the "old" utilization standards, FORPLAN timber volume tables were compiled to the old standards. This was accomplished by recomputing the volume per acre from timber inventory data without counting 6" DBH lodgepole pine and 7" DBH other species, and substituting these tables in FORPLAN for comparison runs. The PNV benchmark and Preferred Alternative were tested.

The results of an analysis of the volume and economic value impacts of converting from the current utilization standards to those in the Northern Regional Guide are shown in Table B-31 and Table B-32 for the Maximum PNV Benchmark and the Preferred Alternative.

TABLE B-31 Comparison of Current vs. Northern Regional Guide Utilization Standards - Flathead National Forest

	Minimum d.b.h.		Minimum top d.i.b.	Minimum Piece Length
Standard	Lodgeple Pine	All Other Species	All Species	All Species
Current	7"	8"	5.6"	8'
Proposed	6"	7"	4.6"	8'

TABLE B-32 Comparison of Timber (MCF and MBF), Present Net Value and Acres Assigned to Timber Between the Current and Northern Regional Guide Utilization Standards - Flathead National Forest

Item	Current Stds.	Proposed Stds.	Difference	% Change
Max PNV Benchmark:				
MMCF	23.6	25.3	1.6	6.4%
MMBF	97.7	103.5	5.8	5.6%
PNV	540.5	605.5	65.0	10.7%
Acres Assigned to Timber	723,130	725,560	+2,430	0.3%
Preferred Alternative:				
MMCF	24.2	25.7	1.5	5.8%
MMBF	95.3	101.0	5.7	5.6%
PNV	427.3	483.0	55.7	11.5%

The suitable timber base of the PNV Benchmark is changed by 0.3 percent from 723,130 to 725,560 suitable acres. The long-term sustained yield capacity decreased by 21 percent to 122 MMBF/year from 155 MMBF/year for the PNV Benchmark. The PNV decreased by 10 percent or about 65 million dollars. The relatively large change in PNV and long-term sustained yield capacity is due to not counting the volume of the 6" lodgepole and 7" other species on each acre that is harvested. As a result more acres must be harvested to produce the equivalent volume, and the costs of sale preparation, logging, site preparation, reforestation, and roads all increase per unit of volume. Also the reduced volume per acre results in the existing sawtimber stands being harvested sooner, which produces an age class distribution that does not PNV to be maximized in later decades as in the new standards. This results in reduced PNV and long-term sustained yield capacity.

A comparison was made substituting the old utilization standards in place of the new standards for the Preferred Alternative harvest schedule acres, and the volume of harvest would be reduced between 4.5 to 6 percent each decade.

The utilization standard comparison results indicate that use of the old utilization standards for long range planning purposes would be economically disadvantageous to the U.S. Government. Timber revenues per acre would be reduced and more costs, both economic and in adverse environmental effects, would be incurred to produce a given timber volume objective. The data also shows that stands of 6- to 7-inch DBH are not scheduled for harvest in the Preferred Alternative simply because they meet the new standards. FORPLAN data show these stands to be pole stands which are uneconomical in Decade 1. Most of the 6- and 7-inch material included in the base harvest schedule is incidental material found in economically mature sawtimber stands. The Flathead National Forest has been requiring the removal of 6" DBH lodgepole pine and 7" DBH other species in timber sale contracts since 1974. No advantages, of using the old timber utilization standards for long range planning purposes, were identified.

2. FUTURE TIMBER PRICE AND PRODUCTION COST TRENDS

There are two major kinds of assumptions affecting timber values used in the FORPLAN model. First an assumption is made about a base (starting) timber value from which future values are projected. Secondly, an assumption is made about what stumpage prices (lumber prices minus production costs) will be in the future.

Timber Price Trends

In Forest planning, price projections have been based on research used in building the 1980 RPA Program (Adam/Haynes). Price trends have since been reestimated by Adams and Haynes for the 1985 RPA Program. Both sets of projections show prices increasing over a 50-year time period although the 1985 RPA projection increases at a slower rate and projections vary by alternative programs.

The following tablulation shows the average effect of both the 1980 and 1985 RPA trends, when the price trends are applied to the 1980 base price for the 50-year period. Also shown for comparison purposes is a new 1984 base price (explained below) with the 1985 RPA trend assumptions applied.

Average Stumpage prices per MBF (1978 dollars)

Decade Year	0 1980	1 1985	2 1995	3 2005	4 2015	5 2025	6 2030+
1974-1980 Base Price (1980 RPA Trends)	95.41	114.60	147.87	186.30	240.47	295.44	326.46
1974-1980 Base Price (1985 RPA Trends)	95.41	95.41	102.82	118.43	137.35	158.84	169.44
1975-1984 Base Price	75.10	75.10	80.35	92.54	110.44	130.24	139.93

In the first step of the sensitivity analysis, the PNV Benchmark was tested with the original base stumpage value assumptions and the new 1985 RPA price trends. A separate run was also made with no price trends, i.e. prices were assumed to remain constant. The effect of the price trend assumptions on both acres designated as timber production, and Present Net Value are shown in the following tabulation:

	Suitable Acres	PNV(Million Dollars)
PNV Benchmark (1980 RPA Trends)	723,130	605.5
Test (With 1985 RPA Trends)	652,010	319.7
Change from PNV Benchmark	-71,120(9.8%)	-285.8(47%)
Test With No Trends	631,500	244.0
Change from PNV Benchmark	-91,630(12.6%)	-361.5(60%)

Changes in the price trend assumptions alone cause only a 10 to 13 percent reduction in the suitable timber base. A large change of up to 60 percent reduction in PNV results. This shows that PNV is sensitive to price assumption trends, but the number of acres economical for timber management is not. On most (87 percent) of the tentatively suitable land, revenues exceed costs even when no future increase in timber values are assumed. The difference between costs and revenues is significantly affected as evidenced by the relative change in PNV. The analysis also indicates the suitable timber base of the Preferred Alternative is within the range indicated by economic data high and low assumptions.

Base Price Update

In the next step of the sensitivity analysis, the PNV Benchmark and Preferred Alternative were tested with the new base prices and the 1985 RPA price trends.

To calculate the new base price, the following procedure was used:

a. The total cut sawtimber volume and the net value received for that sawtimber was calculated for each calendar year using data from the Forest "cut and sold" report. The values were adjusted for inflation to constant (1978) dollars.

b. The net value from the cut and sold reports does not include in-kind road payments made by timber purchasers to the Forest Service. The average amount of road credits per thousand board feet (MBF) were calculated for each calendar year using the Timber Appraisal (Transaction Evidence) data base. The amounts were then adjusted for inflation to constant dollars.

c. The net receipts/mbf and the road credits/MBF were summed then multiplied by the sawtimber volume cut in each calendar year. This sum is the total gross receipts per calendar year.

d. The total gross receipts were summed for the 10-year period then divided by the total volume cut. The result is a weighted average high bid price/MBF that is based on actual Forest Service receipts.

The tabulation below shows these calculations for the Flathead National Forest:

YEAR	VOLUME (MMBF)	VALUE /MBF	INFLA FACTOR	NET VALUE	ROAD CREDITS	GROSS VALUE	TOTAL VALUE
1984	93.02	51.71	0.66	34.02	12.53	46.55	4330.41
1983	97.64	39.17	0.68	26.72	17.40	44.12	4307.41
1982	45.43	25.35	0.71	17.95	16.50	34.45	1565.10
1981	89.22	60.77	0.75	45.76	22.36	68.12	6077.62
1980	95.58	74.62	0.82	61.49	30.80	92.29	8820.87
1979	97.34	74.17	0.90	66.83	41.38	108.21	10533.19
1978	85.73	74.75	0.98	73.18	23.59	96.77	8296.42
1977	109.70	66.92	1.05	70.47	21.02	91.49	10036.22
1976	103.97	62.09	1.11	69.10	20.76	89.86	9342.88
1975	109.33	35.94	1.17	42.05	15.62	57.67	6305.28
TOTALS	926.96						69615.41

BASE PERIOD PRICE/MBF (1978 dollars) EQUALS 75.10

To appraise the stumpage values associated with individual timber sales, the Region has developed statistical models which predict price on the basis of physical sale characteristics. Because these models are based on data from past sales, the procedure is termed a "transaction-evidence" method of appraisal. The current models are based on sales sold during the 36-month period from January 1982, to December 1984. Separate models are used for the east and west side appraisal zones.

The West Side zone consists of the Forests in northern Idaho and western Montana. These include the Bitterroot, Idaho Panhandle, Clearwater, Flathead, Kootenai, Lolo, and Nezperce Forests. Stumpage prices in the West Side zone are highly dependent on the species being cut and the quality of the logs removed. Because stands are harvested using a variety of logging methods and silvicultural systems, logging costs are also highly variable in this zone.

Physical variables that reflect timber and site quality are included in the West Side model. The model predicts that the stumpage price per MBF increases as the "lumber price" (SPLT), average tree diameter (ADBH), and the harvest volume per acre increases.

The lumber price is a measure of the value of the products that can be derived from the stumpage. By constructing FORPLAN economic tables that reflect the separate species value (lumber prices) of each timber yield table, value differences due to species are accounted for. Within each FORPLAN economic table, separate values are given for up to six diameter classes and five volume classes. The effects on value of both tree size and the harvest volume per acre are thus directly considered by the model.

The steepness of the land and the soil sensitivity affect the manner in which a timber stand can be logged. Areas of gentle slopes and stable soils are normally tractor-logged. Steep slopes and unstable soil areas must be logged using more expensive cable systems. The West Side model predicts separate stumpage values for tractor and cable logging. The effect of yarding distance on value is also predicted for each method (costs increase as the yarding distance and road spacing increase). Although helicopter sales were not included when developing the West Side model, logging cost differences between cable and helicopter sales can also be estimated. The influence of logging methods on value is considered in FORPLAN by making separate sets of economic tables for each method.

The West Side model was developed using sale data covering the period from January 1982 to December 1984, and was adjusted to fit the average 10-year base price that was calculated for the Flathead National Forest. The procedure for adjusting the model is as follows:

a. The average value of each physical variable is calculated for the 10-year period (1975-1984).

b. The averages are then substituted into the model. This gives the average stumpage price/MBF predicted by the coefficients of the equation.

c. A plus or minus constant term is then inserted into the equation such that the average predicted price equals the average 10-year base price.

In summary, new base stumpage prices have been developed for the Flathead National Forest using actual receipts data covering the period 1975 to 1984. Variations in stumpage values due to physical characteristics of the stand and site are modeled using the latest research and timber sale transaction information available. This timber valuation methodology is essentially identical to that used in the original FORPLAN model except that base timber values and the stumpage value model has been updated. The original timber value model is described earlier in this chapter.

Revised Stumpage Value Model:

The results of applying the West Side regression coefficients to the mean variable values for the Flathead National Forest are shown in Table B-33. The coefficients and applicable variable values are adjusted for inflation to first quarter 1978 dollars. The mean values were calculated using transaction evidence sale data covering the period 1975 through 1984. In these calculations each sale was weighted according to its size in million board feet.

The mean stumpage price calculated by the regression coefficients is \$89.15/MBF. The actual mean stumpage price for the 10-year base period is \$75.10. The difference between these two numbers, i.e. - 14.55, is added as a constant term to the predictive equation. The stumpage price model for the Flathead is thus:

$$
\begin{aligned}
Y = {} & -14.55 + 0.383\,\mathrm{SPLT} + 1.313\,\mathrm{ADBH} + 4.179\,\mathrm{LNVPA} \\
& -6.760\,\mathrm{YDTRA} - 14.646\,\mathrm{YDGDL} - 13.036\,\mathrm{YDSKY} - 0.1538\,\mathrm{PVSK}
\end{aligned}
$$

Where:

Y is the stumpage price/MBF in 1978 dollars,
SPLT is the lumber price/MBF in 1978 dollars,
ADBH is the average d.b.h. in inches,
LNVPA is the natural log of the harvest volume per acre in MBF,
YDTRA is the proportion of the volume tractor-logged times the mean external yarding distance in thousands of feet,
YDGDL is the proportion groundlead times the yarding distance in thousands of feet,
YDSKY is the proportion skyline times the yarding distance in thousands of feet,
PVSK is the percent of the volume logged by skyline.

TABLE B-33 Stumpage Price Model ($1978) - Flathead National Forest

Variable	Coefficient	Mean Value	Factor
SPLT	0.3830	179.310	68.68
ADBH	1.3130	13.340	17.51
LNVPA	4.1790	2.667	11.15
YDTRA	-6.7600	0.450	-3.14
YDGDL	-14.6460	0.052	-0.76
YDSKY	-13.0360	0.125	-1.63
PVSK	-0.1538	14.030	-2.16
Predicted Price			89.65
10-Year Price			75.10
Constant			-14.55

In most timber sales, BD (brush disposal) collections are taken directly from purchasers as they harvest timber. These monies are then used by the Forest Service to do slash disposal and site preparation type work. In the Flathead FORPLAN model all Forest Service slash disposal costs, regardless of funding source, are included in the economic tables. To prevent the double counting of these costs, the average BD collection/MBF is added back to the base stumpage price for harvest cuts. During the period 1975 to 1984, BD collections averaged $5.11/MBF.

In the Flathead National Forest Plan, 5 different logging methods are analyzed. By substituting the assumed yarding distance for each logging method into the model, the relative cost applicable to each method can be calculated. These calculations are shown in Table B-34.

TABLE B-34 Comparison of Logging Methods - Flathead National Forest

Logging Method	Yarding Distance Feet	Comparative Costs/MBF $	Change From Tractor $
Tractor	600	- 4.06	0.00
Groundlead	750	- 10.98	-6.92
Skyline (SKY 1)	1000	- 28.42	-24.36
Long-Span Skyline (SKY 2)	2000	- 41.45	-37.39
Aerial	NA	-110.77	-106.71

Updating Costs:

All costs were reviewed and adjusted where necessary based on current costs. Current costs are based on FY84-85 contracts and force account projects, then discounted to 1978 value for entering into revised FORPLAN/economic tables. All timber related costs, road construction costs, and implementation costs were revised.

Current costs for road construction and site preparation are significantly lower than the 1979-80 costs used in the EIS analysis. Planting, thinning, sale preparation, and administration costs did not significantly change. Implementation costs for nontimber resources had shifts among resource areas, but did not significantly change in total.

Comparison Results:

The processes described above were used to compile updated FORPLAN economic tables. These updated tables along with 1985 RPA mid-range price trends were used to make FORPLAN comparison runs of the PNV Benchmark and Preferred Alternative displayed in the EIS. The results of the comparison runs using 1985 economic data is described below.

PNV Benchmark Comparison:

	Suitable Acres	PNV(MM $)
PNV Benchmark(1980 Prices and Trends)	723,120	605.5
Test(85 Update Prices, Costs, Trends)	711,060	318.2
Change	-11,060(1.5%)	287.3(47.5%)

In total, updated timber values, costs, and price trends have little affect on the acres which could be cost effectively managed for timber production. The large change in PNV is primarily due to the change in future timber price trends as illustrated by the price trend tests above.

Preferred Alternative Comparison:

	PNV(MM $)
Alternative 17(1980 Prices and Trends)	483.0
Test (Alt. 17 w/1985 Prices, Costs, Trends)	241.5
Change	-241.5(50%)

The change in PNV of the Preferred Alternative is primarily due to the difference in future price trend assumptions. The amount of change is not greatly different from the change in the PNV Benchmark test, when the 1985 RPA price trend was the only change to the model, as displayed above. This indicates the net effect of all the timber price and cost changes result in little change to PNV. Most of the PNV change is due to the change from 1980 to 1985 RPA price trends. Changes in the assumptions regarding future price trends, base timber prices, and costs do not greatly affect the land base suitable for timber harvest on the Flathead National Forest. PNV estimates are primarily affected by the future price trend assumptions. Changes in the baseprice for timber, since 1980, tend to be offset by corresponding changes in costs so that PNV is not greatly changed, as illustrated by the PNV Benchmark and Preferred Alternative comparisons.

Based on the results of these comparisons, it is concluded that the basic mathematical relationships in the FORPLAN model are sound, and that economic data or price trend assumptions did not significantly affect the model's usefulness in the Forest planning process. No further sensitivity testing of economic data is needed.

3. DEPARTURE

The NFMA regulations require that under certain conditions a Forest should consider management alternatives that allow timber harvest schedules to "depart" from a nondeclining yield policy. Nondeclining yield means that the timber harvest in a given decade is always equal to or greater than the previous decade's timber harvest.

The conditions that might necessitate consideration of a departure schedule include; a need to significantly reduce or prevent high mortality losses from any cause, a need to improve the Forest's age class distribution, a need to moderate substantial adverse impacts on a local community that may result from implementation of the base harvest schedule, a need to provide a timber harvest schedule that achieves RPA Program goals if an alternative considered does not already provide for this, and a means of better achieving overall multiple-use objectives.

The ID team's analyses of the alternatives and benchmarks indicate that none of the conditions except the last--improved achievement of multiple-use objectives--apply to the Flathead National Forest at this time. A departure timber harvest schedule for the Preferred Alternative was tested to see if the multiple-use objectives of the Preferred Alternative could be better achieved. The departure was formulated by specifying the long-term sustained yield capacity equal to that generated by the base sale schedule of the Preferred Alternative and the use of sequential harvest constraints of plus or minus 20 percent between decades.

Criteria for desirable effects to be acheived by a departure remain the same as those established by management in the DEIS: 1) provide improved present net value (PNV) of the Forest, and 2) provide additional timber volume to industry in the early decades of the planning horizon when a decline in harvest volume from private land is expected to occur. To be of benefit to industry, the decline in timber volume would have to occur in later decades when production levels from private lands are expected to increase.

Results of the departure analysis of Alternative 17 are very similar to that produced in the DEIS. The departure schedule does provide for increases in timber volume at the time when yields from private timberlands are expected to decline. The additional volume, however, adds small diameter and low quality logs from intermediate harvests to an already substantial volume of small logs in the lodgepole pine harvest scheduled in the Preferred Alternative. Implementation of Alternative 17 Departure would represent a 28 percent increase in intermediate harvest over the current program, requiring additional sales preparation personnel and additional road construction investments.

The departure schedule would reduce the PNV of Alternative 17 by 43.6 million dollars to provide an additional 3 MMBF in the first decade, and 11 MMBF in the second decade. This increase in harvesting would only be temporary, however, as Decade 3 volumes would drop back down to 108 MMBF. This is due to the high levels of intermediate harvesting in Decades 1 and 2, which makes the stands more desirable for economic harvesting after Decades 3 and 4.

Harvesting the small diameter trees in the first two decades (about 14 MMBF more) reduces the harvest in Decades 3 and 4 by 6 MMBF from Alternative 17.

The additional 3 MMBF of first decade timber volume associated with the departure would provide approximately 45 jobs in the three-county local zone of influences and approximately 0.6 million dollars in income additional to that provided through Alternative 17.

These results, when considered in relation to the current economic situation of the local timber industry, does not indicate that an increase in net public benefits would result from adopting the departure schedule and it is not recommended by the ID Team.

APPENDIX C

ROADLESS AREA EVALUATIONS

Page

Introduction C-3

Roadless Inventory Maps C-4

Table C-1 Roadless Need
  Part A - Regional Population Center and Proximity to Roadless Areas on Flathead National Forest C-6

  Part B - Regional Wilderness Opportunities and Proximity to Roadless Lands on Flathead National Forest C-7

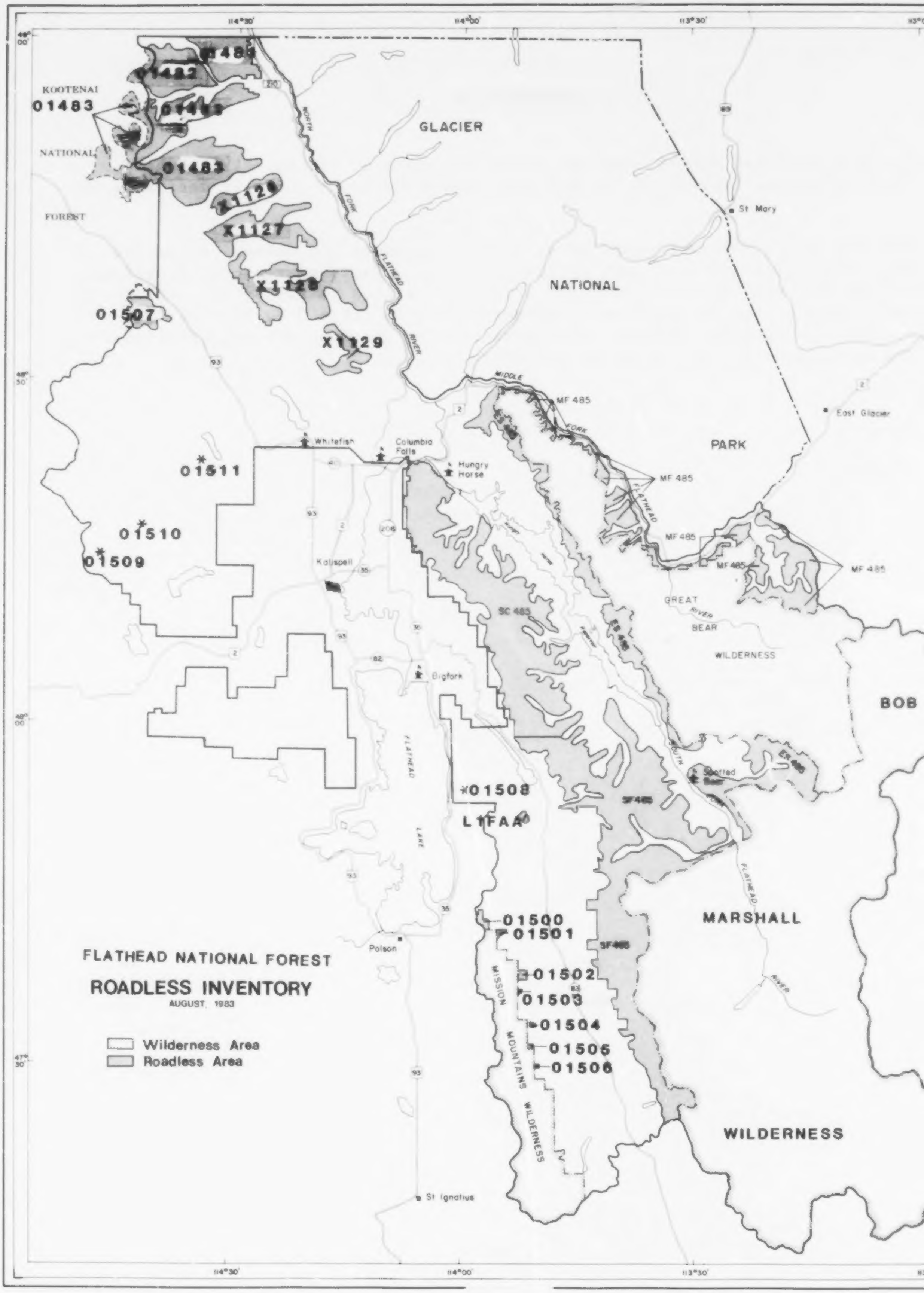
Roadless Write-ups

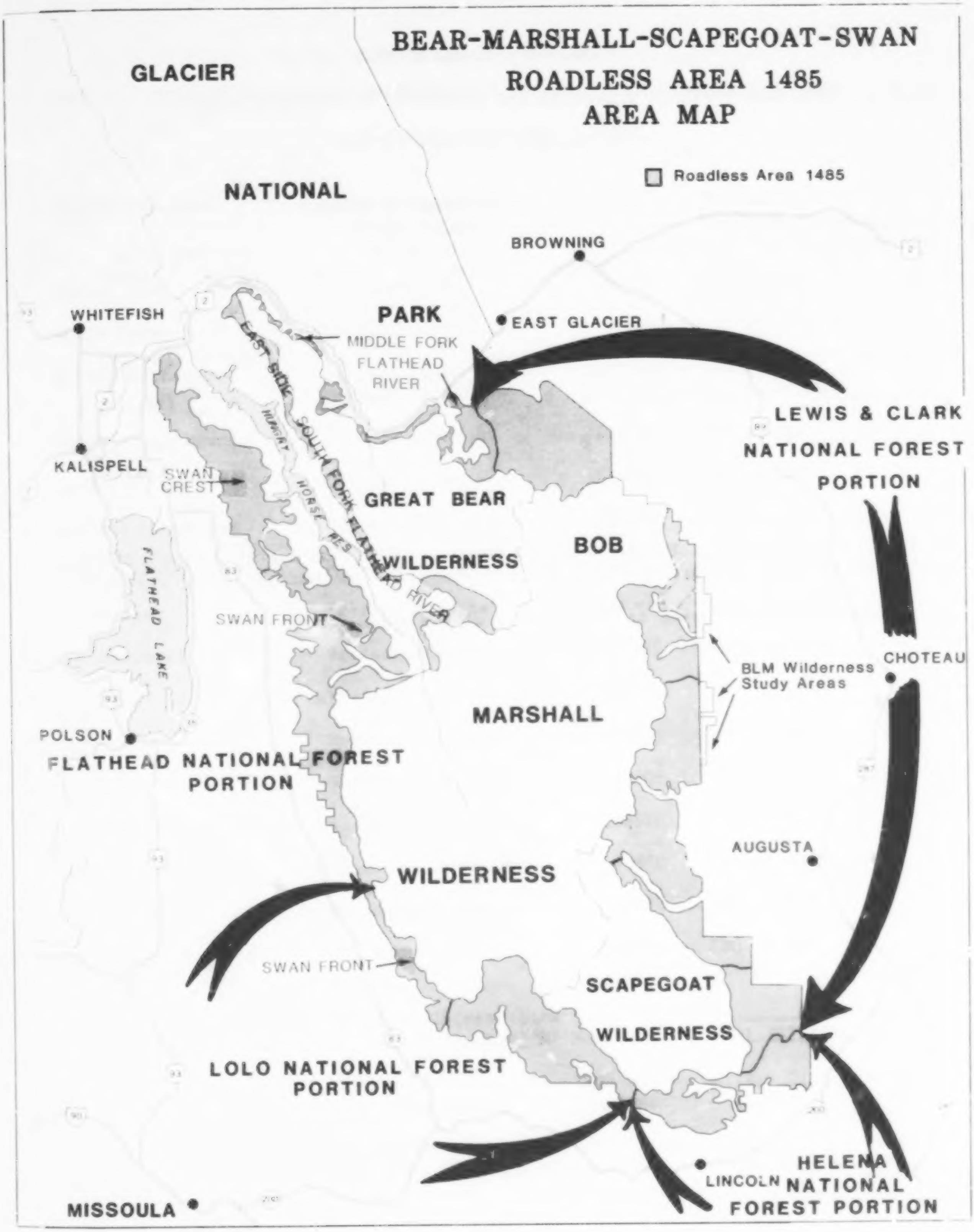
Benchmark (X1126) C-9
Coal Ridge (X1127) C-21
Deadhorse Ridge (X1128) C-33
Standard Peak (X1129) C-45
Swan River Island (LIFAA) C-57
Mission Additions (01500 - 01506) C-67
Le Beau (01507) C-79
Mt. Hefty (01481) C-93
Tuchuck (01482) C-109
Thompson Seton (01483) C-125
Bear-Marshall-Scapegoat-Swan (01485) C-141

INTRODUCTION

Most Flathead National Forest roadless areas are areas of the Forest that have never been developed because it has not been economically or socially desirable to do so.

This Appendix describes each roadless area, the resources and values considered, the range of alternative land uses studied, and the effects of those alternatives. The Flathead National Forest's roadless areas are related to population centers in Table C-1, Part A, and to existing wilderness areas in Table C-1, Part B. Significant site specific effects of alternative designations for each roadless area are summarized in the following narratives.


FLATHEAD NATIONAL FOREST
ROADLESS INVENTORY
AUGUST, 1983
▭ Wilderness Area
▨ Roadless Area
KOOTENAI NATIONAL FOREST
01483
01482
X1129
X1127
X1128
X1129
01507
01511
01510
01509
01508
L1FAA
01500
01501
01502
01503
01504
01505
01506
GLACIER NATIONAL PARK
BOB MARSHALL WILDERNESS
GREAT BEAR WILDERNESS
MISSION MOUNTAINS WILDERNESS
MF 485
SC 485
SF 485
ES 485
NORTH FORK FLATHEAD RIVER
MIDDLE FORK FLATHEAD
SOUTH FORK FLATHEAD RIVER
FLATHEAD LAKE
St Mary
East Glacier
Whitefish
Columbia Falls
Hungry Horse
Kalispell
Bigfork
Polson
St Ignatius
Spotted Bear
114°30'
114°00'
113°30'
49° 00'
48° 30'
48° 00'
47° 30'



BEAR-MARSHALL-SCAPEGOAT-SWAN ROADLESS AREA 1485 AREA MAP

▢ Roadless Area 1485
GLACIER
NATIONAL
PARK
BROWNING
EAST GLACIER
WHITEFISH
KALISPELL
MIDDLE FORK FLATHEAD RIVER
EAST SIDE
SWAN CREST
HUNGRY HORSE RES
SOUTH FORK FLATHEAD RIVER
GREAT BEAR WILDERNESS
BOB MARSHALL WILDERNESS
LEWIS & CLARK NATIONAL FOREST PORTION
FLATHEAD LAKE
SWAN FRONT
BLM Wilderness Study Areas
CHOTEAU
POLSON
FLATHEAD NATIONAL FOREST PORTION
AUGUSTA
SWAN FRONT
SCAPEGOAT WILDERNESS
LOLO NATIONAL FOREST PORTION
HELENA NATIONAL FOREST PORTION
LINCOLN
MISSOULA
2
93
89
83
200
287
90

TABLE C-1 ROADLESS NEED

PART A: REGIONAL POPULATION CENTERS AND PROXIMITY TO ROADLESS AREAS ON FLATHEAD NATIONAL FOREST*

POPULATION CENTERS**	EXISTING FLATHEAD ROADLESS AREAS 50 Miles AREAS	ACRES	51-100 Miles AREAS	ACRES	101-200 Miles AREAS	ACRES
Spokane, WA	0	0	0	0	20	495,430
Missoula, MT	0	0	11	309,390	9	186,040
Great Falls, MT	0	0	0	0	20	495,430

* The Flathead National Forest Roadless inventory (495,430 acres) is part of the 8.1 million acres of roadless area in northern Idaho and Montana being evaluated.

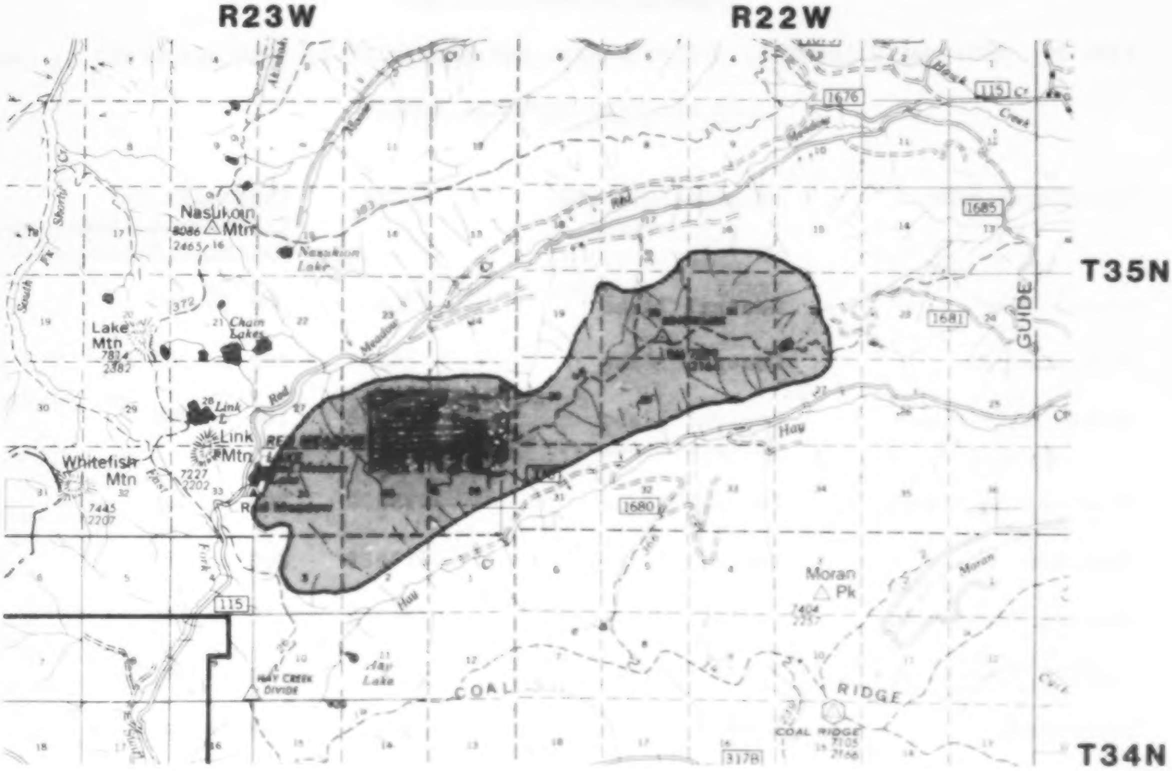
** "Urbanized Areas" noted in 1980 census of the population.

TABLE C-1 ROADLESS NEED

PART B: REGIONAL WILDERNESS OPPORTUNITIES AND PROXIMITY TO ROADLESS LANDS ON FLATHEAD NATIONAL FOREST

Wilderness Name	General Location	Acres	Proximity to Flathead National Forest - Miles
Gospel Hump	Central Idaho	206000	100 to 200
Hells Canyon	Central Idaho	84100	200 to 300
Selway Bitterroot	Central Idaho Western Montana	1089238 251443	100 to 200
River of No Return	Central Idaho	2239000	200 to 300
Sawtooth	Central Idaho	217088	200 to 300
Cabinet Mountains	Western Montana	94272	50 to 100
Mission Mountains	Western Montana	73877	less than 50
Great Bear	Western Montana	286700	less than 50
Bob Marshall	Western Montana	1009356	less than 50
Scapegoat	Western Montana	239936	50 to 100
Welcome Creek	Western Montana	28135	100 to 200
Rattlesnake	Western Montana	33000	50 to 100
Anaconda-Pintler	Western Montana	158516	100 to 200
Gates-of-the-Mtns.	Western Montana	28562	100 to 200
Red Rock Lakes	South-West Montana	32350	200 to 300
Absaroka-Beartooth	South-Central Mont.	921584	200 to 300

Total wilderness less than 100 miles From Flathead NF Roadless	6 1,737,141	Areas Acres
Total wilderness 100 - 200 miles From Flathead NF Roadless	5 1,761,894	Areas Acres
Total wilderness 200 - 300 miles From Flathead NF Roadless	5 3,494,122	Areas Acres


R23W
R22W
T35N
T34N
Nasukoin Mtn
8086
2465
Nasukoin Lake
Chain Lakes
Lake Mtn
7824
2382
Link L
Link Mtn
7227
2202
Whitefish Mtn
7445
2207
Red Meadow
Red
Meadow
Hay
Moran Pk
7404
2257
COAL
RIDGE
COAL RIDGE
Hay Creek Divide
Hay Lake
GUIDE
115
1676
1685
1681
1680
372
3178

BENCHMARK
X1126

ROADLESS AREA

▨ **ROADLESS AREA**

SCALE

1 0 1 3

MILES

BENCHMARK X1126 (RARE I No. 00126) - FLATHEAD NATIONAL FOREST

Total Gross Acres: 6,490 Total Net Acres: 6,490

A. DESCRIPTION

Benchmark roadless area is located in the north end of the Flathead National Forest, 17 miles south of the Canadian border. It is one of seven roadless areas located in what is often referred to as the "North Fork." The North Fork region lies adjacent to Glacier National Park and is bordered by the North Fork of the Flathead River on the east and the Whitefish Mountain Range or Divide on the west.

This area lays east/west along a ridge and surrounds Benchmark Peak. It is approximately 7 miles long and 2 miles wide. The terrain predominately consists of high, rugged ridgetops and upper slopes overlooking developed drainages. The area is covered with open coniferous forest stands with many areas of rock outcrops and some open grassy areas on very shallow soils.

This roadless area is located to the south of the Red Meadow Creek Road and to the North of the Hay Creek Road. The site is totally within Flathead County and is primarily surrounded by roaded timber management lands.

Access from the east is by secondary roads off Road #210 (the North Fork Road). Western access is through the Stillwater State Forest along secondary roads. The Whitefish Divide-Smokey Range Trail #26, touches on the western boundary of this area.

Primary ecosystems present include whitebark pine/subalpine fir on the ridgetops and subalpine fir/bear grass on the southeast to southwest aspects. Timber types vary from whitebark pine at the upper limits to Engelmann Spruce at the lower limits. The land around Red Meadow Lake is noted for its scenic value in the fall when the shrub covered slopes turn color.

Wildlife species present include elk, whitetail deer, black bear, mule deer, wolverine, the hoary marmot, golden eagle, and the lynx. This area is also inhabited by the grizzly bear which is classified by the U.S. Fish and Wildlife Service as a threatened species.

Primary uses in this area are hunting and hiking, with some use from snowmobiling, cross country skiing, and camping. There are trails that interconnect within the area.

B. CAPABILITY

1. NATURAL INTEGRITY AND APPEARANCE

This roadless area, as it stands, has many off site intrusions around the edges in the form of existing roads and visible cutting units.

The naturalness of the area has been disrupted by the previously mentioned trails; however, visitors to the area would feel that the greater portion maintains a natural appearance.

2. OPPORTUNITIES FOR SOLITUDE

Few opportunities for solitude exist within this area because of the poor vegetative and topographic screening.

3. PRIMITIVE RECREATION OPPORTUNITIES

There are day hiking opportunities along the narrow ridge to Benchmark Peak.

Few opportunities for a primitive experience exist, due to small perimeter to core distances and limited screening from the sights and sounds of man.

4. OTHER FEATURES

The area is considered to have good scenic value due to its panoramic views into Glacier National Park from the ridges.

5. MANAGEABILITY AND BOUNDARIES

The area was inventoried and evaluated in RARE I and the 1974 North Fork Planning Unit EIS. As planned by the North Fork Unit Plan, the size of the roadless area has been reduced by timber management activities from the 8,960 acres inventoried in RARE I to the current 6,490 acres. The current roadless area would be difficult to manage as a wilderness unit because the boundaries are not delineated by permanent features.

C. AVAILABILITY

1. RESOURCE POTENTIALS

The discussion that follows refers to significant resources present within this roadless area other than the previously discussed wilderness resource. The chart on the following page summarizes the existing resource potential for this roadless area.

Wildlife

This area is within Situation 1 grizzly bear habitat, which is vital to the survival and recovery of the species from its threatened status.

Wildlife presence and values in this area are diverse. The area is used as a noncritical summer range by big game species. Various fur bearers and nongame species also inhabit the area. No specific critical wildlife habitat needs have been identified in this area.

Minerals

This area is within the Montana Overthrust Belt. The area is rated as having high oil and gas potential. The entire area has existing oil and gas leases in effect, and there is continuous seismic investigation in this area. Hardrock mineral potential is considered to be low.

BENCHMARK ROADLESS AREA (X1126)

Category	Unit	
Gross Acres	Acres	6,490
Net Acres	Acres	6,490
Recreation		
Primitive	RVD's	0
Semiprim. Nonmotor	RVD's	228
Semiprim. Motor.	RVD's	0
Roaded Natural	RVD's	0
Range		
Existing Obligated		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Existing Vacant		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Proposed		
Suitable	Acres	0
AUM's	AUM's	0
Timber		
Tentative Suitable	Acres	1,439
Standing Volume	MBF	10,766
Corridors		
Exist. & Potential	No.	0
Wildlife - T&E		
Grizzly Bear Habitat		
Situation 1	Acres	6,490
Situation 2	Acres	0
Situation 3	Acres	0
Gray Wolf		
Habitat	Acres	0

Category	Unit	
Wildlife - Big Game		
Summer Habitat	Acres	0
Winter Habitat	Acres	0
Significant Fisheries		
Stream Miles	Miles	0
Stream Habitat	Hab. Ac.	0
Lakes	No.	0
Lake Habitat	Hab. Ac.	0
Water Developments		
Existing	No.	0
Minerals		
Hardrock Potential		
Very High	Acres	0
High	Acres	0
Moderate	Acres	0
Low	Acres	6,490
Mining Claims	No.	0
Oil & Gas Potential		
Very High	Acres	0
High	Acres	6,490
Moderate	Acres	0
Low	Acres	0
Oil & Gas Leases		
Leases	No.	7
Leased Area	Acres	6,490

Timber

Whitebark pine and alpine larch are long-lived species and are major stand components above 6,000 feet in elevation. In 1978 the lodgepole pine and whitebark pine in the roadless area began experiencing an epidemic infestation of mountain pine beetle. Between 1978 and 1982, this insect had spread throughout the lodgepole pine and whitebark pine stands resulting in moderate mortality throughout this roadless area. The spruce bark beetle is active in portions of the area. This mortalit results in a buildup of ground fuel and greatly increases the risk of large wildfires.

There are approximately 1,439 acres of potentially suitable timberlands included in this area. Most of these stands are on steep slopes and timber management costs are generally high.

Recreation

Recreation uses include primarily hunting, with some use from snowmobiling, cross-country skiing and camping. Current recreational us is from local residents primarily. The overall use for this area is considered to be moderate.

Land Use Authorizations

There are no private inholdings or special uses within the interior of this area. There is no potential for domestic grazing.

2. MANAGEMENT CONSIDERATIONS

Moderate to high risks would be involved in containing natural forces of fire or insect and disease outbreaks within the areas.

D. NEED

1. PROXIMITY TO DESIGNATED WILDERNESSES AND TO POPULATION CENTERS

Refer to Table C-1, Part A and B for proximity data. In addition to the National Forest wilderness and roadless areas listed in the table, the Benchmark area is located just a few miles west of the 1,000,000 acre Glacier National Park. A large part of Glacier National Park is currently being studied for wilderness classification. Additional roadless and wilderness areas are available in Canada in the form of Provincial Parks and Forests within 100 miles of Flathead National Forest. The relatively small amount of current recreational use the ar receives is attributed to the fact that an abundance of high quality wilderness opportunities exist in the forest zone of influence along wi the fact that the Benchmark area is not well known in population centers. Current use is primarily from local residents.

2. CONTRIBUTION TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM

The vegetative habitat types, plant species, most animal species, and geologic types known to exist in this area are well represented in existing wilderness areas. This area has the potential to contribute to grizzly bear/gray wolf recovery.

3. PUBLIC INTERESTS

Expressed public need and support for wilderness classification of this area is low. The public had opportunity to comment in the 1974 unit plan and in September 1983 when the area was reevaluated in the Forest planning process.

The public was given an opportunity to again comment on classification of this roadless area when the DEIS Supplement was released for public review in November of 1984. Again public support for wilderness designation of the area was low. Primarily the commenters were concerned over the possible loss of motorized recreation opportunities.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENT BY ALTERNATIVE

The estimated acres of management emphasis for the Benchmark roadless area are displayed in the following tabulation for all 17 Forest Plan Alternatives. The roadless area would be managed differently under the various alternatives in order to contribute appropriately to meeting the Forest objectives in each case. The designations are summarized on the following page by management emphasis.

2. IMPACTS

a. Designation: Wilderness
Management Emphasis: Wilderness

Alternatives 9 and 16 designate 100 percent of the roadless area to wilderness. Wilderness designation will preserve or enhance wilderness attributes.

Current uses which may not conform with wilderness management include oil and gas leasing. All of the 6,490 acres have been leased. No timber harvest would be permitted. Current contracts for oil and gas leases would be permitted to run their course with emphasis on contract administration to protect wilderness attributes. Oil and gas exploration and development costs would be increased.

The nonpriced components are affected as follows:

- Visual quality would be preserved.
- National Wilderness Preservation System lands will increase.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVES

Management Emphasis*	Alternatives (Acres) 1	2	3	4	5	6	7	8
Wilderness	0	0	0	0	0	0	0	0
Roadless	5,816	5,721	5,696	821	3,740	5,650	5,260	5,736
Minimum Level	0	0	0	4,795	2,310	0	0	0
Wildlife	0	0	0	0	0	0	0	0
Timber W/Roads	674	769	654	874	440	840	1,230	654
Timber W/O Roads	0	0	140	0	0	0	0	100
Total	6,490	6,490	6,490	6,490	6,490	6,490	6,490	6,490

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	1	2	3	4	5	6	7	8
ROADED	1 ------------>	0	0	0	0	0	240	240	0
	5	674	769	794	874	440	840 Z	1,230	754
ROADLESS	1 ------------>	6,490	6,490	6,490	6,490	6,490	6,250	6,250	6,490
	5	5,816	5,721	5,696	5,616	6,050	5,650	5,260	5,736
WILDERNESS	1 ------------>	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

Management Emphasis*	Alternatives (Acres) 9	10	11	12	13	14	15	16	17PA
Wilderness	6,490	0	0	0	0	0	0	6,490	0
Roadless	0	3,740	5,736	5,736	5,736	5,736	5,736	0	5,976
Minimum Level	0	2,310	0	0	0	0	0	0	0
Wildlife	0	0	0	0	0	0	0	0	0
Timber W/Roads	0	0	654	654	654	654	654	0	449
Timber W/O Roads	0	440	100	100	100	100	100	0	65
Total	6,490	6,490	6,490	6,490	6,490	6,490	6,490	6,490	6,490

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	9	10	11	12	13	14	15	16	17PA
ROADED	1 ------------>	0	0	0	0	0	0	0	0	0
	5	0	0	754	754	754	754	754	0	514
ROADLESS	1 ------------>	0	6,490	6,490	6,490	6,490	6,490	6,490	0	6,490
	5	0	6,490	5,736	5,736	5,736	5,736	5,736	0	5,976
WILDERNESS	1 ------------>	6,490	0	0	0	0	0	0	6,490	0
	5	6,490	0	0	0	0	0	0	6,490	0

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

- Grizzly bear, elk, and other wildlife species would have increased security.
- Diversity would tend towards climax vegetation. This would depend on what type of fire management programs were implemented.
- Water quality and fisheries quality would be maintained at natural levels.
- Local employment and income would decrease due to a reduced timber base and reduced nonwilderness recreational opportunities.
- All nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool and other scientific values would be provided.

The economic and social effects would be greatest in Alternatives 9 and 16 which designate all this roadless area to wilderness. The future capacity of the Forest to produce timber and accommodate recreation use would be reduced more than in other alternatives, and maximum displacement of existing uses would occur.

b. **Designation: Nonwilderness**
Management Emphasis: Roadless

Alternatives 9 and 16 designate no acres to these prescriptions. Other alternatives designate from 13 to 90 percent of the roadless area to roadless management. The Preferred Alternative designates 92 percent of the inventoried area to roadless. This designation maintains a continuing roadless resource in the area.

The effect of the roadless designation is to maintain the roadless resource by establishing that management objective. Other resources are managed subject to the primary roadless objective. Wilderness attributes may be affected differently depending on the recreation or wildlife habitat objectives of local areas. Modification of natural systems to accommodate multiple-use objectives is most noticeable when trails, campsites, or other recreation facilities are constructed and maintained.

Vegetation management practices for wildlife habitat or other purposes may involve prescribed burning. Motorized equipment, such as chainsaws, helicopters, motorbikes, and snowmobiles, are often used to facilitate cost-efficient management or maintenance activities or as part of the recreation opportunities. Although these activities or uses affect wilderness attributes at the time of implementation, they are short-term effects and the wilderness attributes could be easily reclaimed by eliminating this use and allowing vegetation to regrow.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be maintained.
- Grizzly bear and other wildlife security will be maintained.

- Diversity will be maintained at current or higher levels.
- Water quality and fisheries quality would be maintained or improved through management.
- Employment and income from wood products will not be provided.
- Many nonpriced benefits of wilderness such as spiritual values, gene pool, and other scientific values and natural appearance will be provided.

The roadless resource could be impacted by exploration and development of mineral resources. This resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. The Bureau of Land Management is the final authority for Federal mineral management. The probability of roading and development in this area is remote. If such development is proposed and implemented, it would be integrated into surface resource management to the extent that is reasonable. The most probable mineral development in this area is oil and gas. Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling. The probability of occurrence sharply diminishes with each step.

Although these activities would be mitigated to be consistent with roadless management objectives, some of the nonpriced components would be affected in the field development stage as follows:

- Existing visual conditions may be temporarily lowered.
- Introduction of roads and exploration activities adversely affect the quality of the recreation setting.
- Wildlife security would be reduced and temporary displacement from normal seasonal ranges may occur.
- Employment and income from the oil and gas resources would be provided.

c. **Designation: Nonwilderness**
Management Emphasis: Minimum Level

This emphasis requires no management activities except to maintain existing improvements and resources. In alternatives which designate large contiguous areas to this prescription, no developments would occur due to surface resources. For alternatives which designate small areas which are not contiguous, the management direction may provide for roads to cross these areas to support management objectives of the adjacent management units. The geographic configurations of the designations in each alternative determine the effects minimum management may have on wilderness attributes.

Alternatives 5 and 10 designate only small isolated areas which do not need to be managed in order to achieve the objectives of each alternative. Alternative 4 designates 74 percent of the roadless area to this prescription to minimize costs and maximize revenues. These areas are the lands between the suitable timberlands and the ridge top recreation trails.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be available but not by management design.
- Grizzly bear and other wildlife species will have security maintained.
- Diversity would tend toward climax species.
- Water quality and fisheries would not be affected by management activities.
- Minimum contribution to employment and income would result as there will be no commodity outputs and only incidental recreation use.
- Many nonpriced wilderness benefits may still be provided by this management prescription since only minimum cost caretaking activities, such as fire protection, would affect the land.

d. **Designation: Nonwilderness**
Management Emphasis: Timber with Roads

High elevation alpine ridges not capable of commercial timber production form the bulk of the area, with lower elevation fringe areas of potentially suitable timberlands. As a result, these acres are at the end of local roads that access adjacent suitable roaded areas. Implementation would proceed rather slowly over a period of 50 years with only about one-fifth of the area accessed in Decade 1. Thus, most of the contiguous roadless areas will have future opportunities to be evaluated for inclusion in the wilderness system with slightly reduced areas where timber management activities have been implemented.

All alternatives, except 9, 10, and 16, designate a portion of the area to timber management emphasis prescriptions. The consequences of these designations is a loss of wilderness attributes at the time of implementation of timber harvest or support activities requiring roads. The roadless resource and wilderness attributes of natural integrity, natural appearance, opportunity for solitude, and primitive recreation are foregone when these management prescriptions are implemented.

The nonpriced components are affected as follows:

- Visual quality will be modification or maximum modification where man's activities will dominate the landscape.
- Semiprimitive nonmotorized and wilderness recreation attributes would be foregone within 50 years.
- Elk security and big-game hunting opportunities would be reduced but mitigated through road-use management depending on site-specific needs.
- Diversity would be improved and nongame wildlife would be maintained.

- Water quality and fisheries would be adversely affected but mitigated through the use of "Best Management Practices".
- Grizzly bear habitat would be suboptimal but mitigated to the extent possible according to site-specific needs.
- Local economic stability would be provided by supporting the highest level of woods products industry jobs.

These prescriptions provide for a wide range of multiple-use benefits both priced and nonpriced. The flow of these benefits in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices.

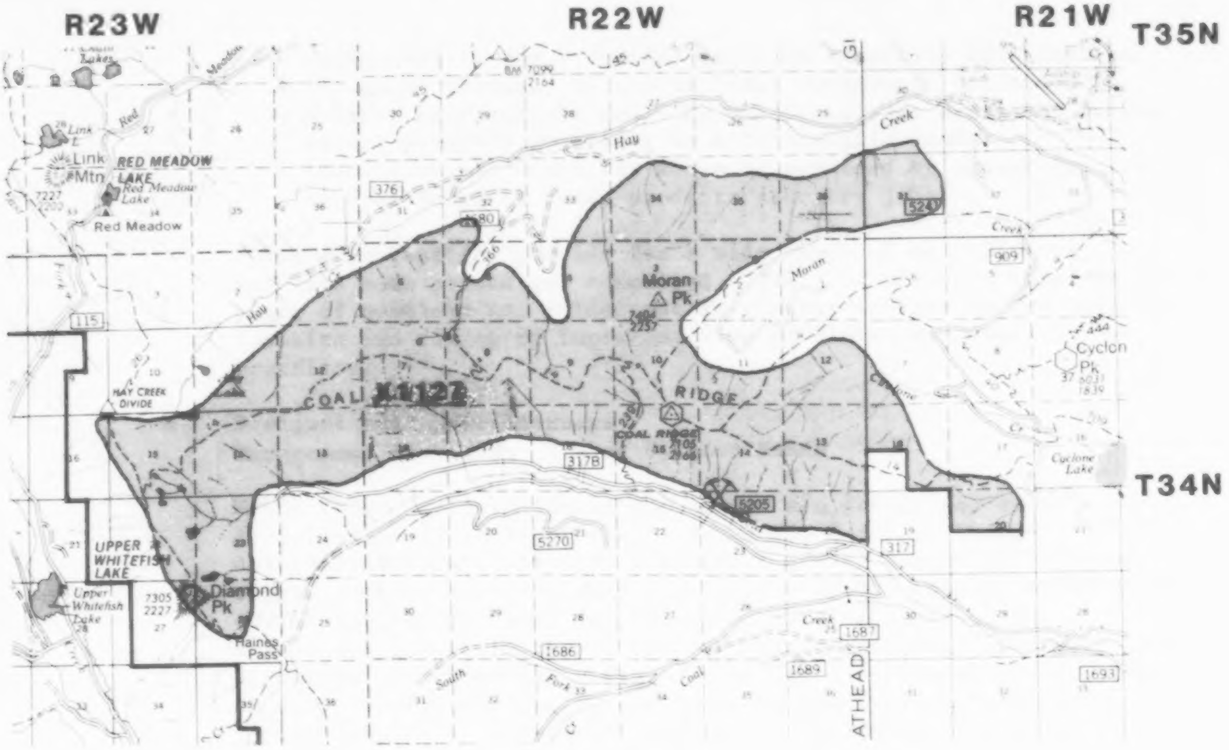
e. **Designation: Nonwilderness**
Management Emphasis: Timber Without Roads

Minor fringe areas suitable for timber are designated as this prescription in Alternatives 3, 8, 10-15, and 17. Those designations are areas with commercial timber potential on steep, rugged terrain mostly within 1 mile of a road. Logging would employ aerial yarding systems, and no roads would be constructed. Implementation would impact the vegetation and would not reach long distances into roadless areas. Since the land itself would not be changed, wilderness attributes could be easily reclaimed after implementation by vegetative regrowth. Implementation would proceed slowly for all alternatives designating these prescriptions. No areas would be affected in Decades 1 and 2. Harvesting would occur by Decade 5 when economic efficiency of the prescription is projected to be best. The prescription would not make significant changes in economic or social effects.

The nonpriced components are affected as follows:

- Visual quality objectives appropriate to local areas will be part of project design with modification the most common VQO.
- Semiprimitive nonmotorized recreation would be provided with wilderness attributes retained or recoverable after implementation.
- Elk and grizzly bear security would be maintained.
- Diversity of plant and animal communities would be maintained or improved in the long term.
- Water quality and fisheries would not be affected.
- Support of local employment and income would be less than timber roaded due to the lower intensity of timber management.

Oil and gas activity would be limited to seismic surveys because all slopes in this management prescription are greater than 60 percent. All areas leased contain a no-surface occupancy stipulation.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R22W
R21W
T35N
T34N
RED MEADOW LAKE
Red Meadow Lake
Red Meadow
Link Mtn
Link L.
Hay
Hay Creek
Creek
Moran Pk
7404
2257
Moran
Cyclone Pk
Cyclone
Cyclone Lake
HAY CREEK DIVIDE
COAL RIDGE
X1127
COAL RIDGE
7105
2166
UPPER WHITEFISH LAKE
Upper Whitefish Lake
Diamond Pk
7305
2227
Haines Pass
South Fork Coal Creek
ATHEAD
376
380
115
317B
5205
5270
524
909
317
1687
1686
1689
1693

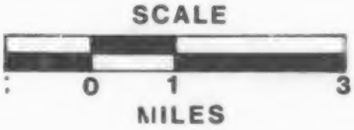
COAL RIDGE

X1127

ROADLESS AREA

☐ **ROADLESS AREA**

⚒ **PIT SITE**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COAL RIDGE X1127 (RARE I NO. 00127) - FLATHEAD NATIONAL FOREST

Total Gross Acres: 16,480 Total Net Acres: 16,480

A. DESCRIPTION

Coal Ridge roadless area is located in the north end of the Flathead National Forest, 19 miles south of the Canadian border. It is one of seven roadless areas located in what is often referred to as the "North Fork." The North Fork region lies adjacent to Glacier National Park and is bordered by the North Fork of the Flathead River on the east and the Whitefish Mountain Range or Divide on the west.

This area lays east/west along Coal Ridge and surrounds Moran Peak, and is approximately 10 miles long and 2 1/2 miles wide. The terrain consists of predominately high, rugged ridgetops and upper slopes overlooking developed drainages. The area is covered with open coniferous forest stands, with many areas of rock outcrops and some open grassy areas on very shallow soils.

This roadless area is located to the south of the Hay Creek Road and to the north of the Coal Creek Road. The site is totally within Flathead County and is primarily surrounded by roaded timber management lands. The southeast corner borders State Forestry land.

Access from the east is by secondary roads off Road #210 (the North Fork Road). Western access is through the Stillwater State Forest along secondary roads and then by trail. The Whitefish Divide-Smokey Range Trail #26 touches on the western boundary of this area.

Primary ecosystems present include whitebark pine/subalpine fir on the ridgetops, and subalpine fir/bear grass on the southeast to southwest aspects. Timber types vary from whitebark pine at the upper limits to Engelmann spruce at the lower limits.

Wildlife species present include elk, whitetail and mule deer, black bear, wolverine, the hoary marmot, golden eagle, and the lynx. This area is also inhabited by the grizzly bear, which is classified by the U.S. Fish and Wildlife Service as a threatened species, and the gray wolf, classified as an endangered species.

Primary uses include hunting and hiking, with some use from snowmobiling, cross-country skiing, and camping. There are several trails that interconnect within the area. One trail (#14) runs the full length of Coal Ridge. Diamond Lake is stocked by the Montana Department of Fish, Wildlife, and Parks.

B. CAPABILITY

1. NATURAL INTEGRITY AND APPEARANCE

This roadless area, as it stands, has many off-site intrusions around the edges in the form of existing roads and visible cutting units.

The naturalness of the area has been disrupted by the previously mentioned trails; however, visitors to the area would feel that the greater portion maintains a natural appearance.

2. OPPORTUNITIES FOR SOLITUDE

Opportunities for solitude exist over the greater portion of this area; however, the distance from perimeter to core is short with poor vegetative and topographic screening.

3. PRIMITIVE RECREATION OPPORTUNITIES

Few opportunities for a primitive experience exist, due to small perimeter to core distances and limited screening from the sights and sounds of man's activities. Day hiking opportunities are available along Coal Ridge.

4. OTHER FEATURES

The area is considered to have good scenic value due to the panoramic views into Glacier National Park from the ridges.

5. MANAGEABILITY AND BOUNDARIES

The area was inventoried and evaluated in RARE I and in the 1974 North Fork Planning Unit EIS. As planned by the North Fork Unit Plan, the size of the roadless area has been reduced by timber management activities from the 17,700 acres inventoried in RARE I to the current 16,480 acres. Boundaries of the current roadless area would be difficult to manage as a wilderness unit because they are not delineated by permanent features.

C. AVAILABILITY

1. RESOURCE POTENTIALS

The discussion that follows refers to significant resources present within this roadless area other than the previously discussed wilderness resource. The chart on the previous page summarizes the existing resource potential for this roadless area.

Wildlife

This area is within Situation 1 grizzly bear habitat, which is vital to the survival and recovery of the species from its threatened status.

Wildlife presence and values in this area are diverse. The area is used as a noncritical summer range by big-game species. Various fur bearers and nongame species also inhabit the area. No specific critical wildlife habitat needs have been identified in this area.

Minerals

This area is within the Montana Overthrust Belt. It is rated as having high oil and gas potential. The entire area has existing oil and gas leases in effect, and there is continuous seismic investigation in this area. Hardrock mineral potential is considered to be low.

COAL RIDGE ROADLESS AREA (X1127)

Category	Unit	
Gross Acres	Acres	16,480
Net Acres	Acres	16,480
Recreation		
Primitive	RVD's	0
Semiprim. Nonmotor	RVD's	297
Semiprim. Motor.	RVD's	135
Roaded Natural	RVD's	468
Range		
Existing Obligated		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Existing Vacant		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Proposed		
Suitable	Acres	0
AUM's	AUM's	0
Timber		
Tentative Suitable	Acres	4,374
Standing Volume	MBF	39,750
Corridors		
Exist. & Potential	No.	0
Wildlife - T&E		
Grizzly Bear Habitat		
Situation 1	Acres	16,480
Situation 2	Acres	0
Situation 3	Acres	0
Gray Wolf		
Habitat	Acres	600

Category	Unit	
Wildlife - Big Game		
Summer Habitat	Acres	0
Winter Habitat	Acres	0
Significant Fisheries		
Stream Miles	Miles	0
Stream Habitat	Hab. Ac.	0
Lakes	No.	0
Lake Habitat	Hab. Ac.	0
Water Developments		
Existing	No.	0
Minerals		
Hardrock Potential		
Very High	Acres	0
High	Acres	0
Moderate	Acres	0
Low	Acres	16,480
Mining Claims	No.	0
Oil & Gas Potential		
Very High	Acres	0
High	Acres	16,480
Moderate	Acres	0
Low	Acres	0
Oil & Gas Leases		
Leases	No.	15
Leased Area	Acres	16,480

Timber

Whitebark pine and alpine larch are long-lived species and are major stand components above 6,000 feet in elevation. In 1978 the lodgepole pine and whitebark pine in the roadless area began experiencing an epidemic infestation of mountain pine beetle. Between 1978 and 1982 this insect had spread throughout the lodgepole pine and whitebark pine stands resulting in moderate mortality throughout this roadless area. The spruce bark beetle is active in portions of the area. This mortality results in a buildup of ground fuel and greatly increases the risk of large wildfires.

There are approximately 4,374 acres of potentially suitable timberlands included in this area. Most of these stands are on steep slopes and timber management costs are generally high.

Recreation

Recreation uses include primarily hunting with some use from snowmobiling, cross-country skiing, and camping. Current recreational use is from local residents, primarily. The overall use for this area is classified as moderate. The Whitefish Divide-Smokey Range Trail on the western boundary has been designated as the Ralph Thayer National Recreation Trail. The Coal Ridge trail system ties into this trail.

Land Use Authorizations

There are no private inholdings or special uses within the interior of this area. There is no potential for domestic grazing.

2. MANAGEMENT CONSIDERATIONS

Moderate to high risks would be involved in containing natural forces of fire or insect and disease outbreaks within the areas.

D. NEED

1. PROXIMITY TO DESIGNATED WILDERNESSES AND TO POPULATION CENTERS

Refer to Table C-1, Part A and B for proximity data. In addition to the National Forest wilderness and roadless areas listed in the table, the Coal Ridge area is located just a few miles west of the 1,000,000 acre Glacier National Park. A large part of Glacier National Park is currently being studied for wilderness classification. Additional roadless and wilderness areas are available in Canada in the form of Provincial Parks and Forests within 100 miles of Flathead National Forest. The relatively small amount of current recreational use the area receives is attributed to the fact that an abundance of high quality wilderness opportunities exist in the Forest zone of influence along with the fact that the Coal Ridge area is not well known in population centers. Current use is primarily from local residents.

2. CONTRIBUTION TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM

The vegetative habitat types, plant species, most animal species, and geologic types known to exist in this area are well represented in existing wilderness areas. This area does have the potential to contribute to grizzly bear/gray wolf recovery.

3. PUBLIC INTERESTS

Expressed public need and support for wilderness classification of this area is low. The public had opportunity to comment in the 1974 Unit Plan and in September 1983 when the area was reevaluated in the Forest planning process.

The public was given an opportunity to again comment on classification of this roadless area when the DEIS Supplement was released for public review in November of 1984. Again public support for wilderness designation of the area was low. Primarily the commenters were concerned over the loss of motorized recreation opportunities. They would like to see Coal Ridge open to snowmobiling.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENT BY ALTERNATIVE

The estimated acres of management emphasis for the Coalridge roadless area are displayed in the following tabulation for all 17 Forest Plan Alternatives. The roadless area would be managed differently in the various alternatives in order to contribute appropriately to meeting Forest objectives in each case. The designations are summarized by management emphasis.

2. IMPACTS

a. Designation: Wilderness
Management Emphasis: Wilderness

Alternatives 9 and 16 designate 100 percent of this roadless area to wilderness. Wilderness designation will preserve or enhance wilderness attributes.

Current uses which may not conform with wilderness management include oil and gas leasing. All of the 16,480 acres have been leased. Current contracts for oil and gas leases, would be permitted to run their course with emphasis on contract administration to protect wilderness attributes. Oil and gas exploration and development costs would increase. No timber harvest would be permitted.

The nonpriced components are affected as follows:

- Visual quality would be preserved.
- National Wilderness Preservation System lands will increase.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

	Alternatives (Acres)							
Management Emphasis*	1	2	3	4	5	6	7	8
Wilderness	0	0	0	0	0	0	0	0
Roadless	15,716	12,169	12,354	4,817	12,790	12,610	12,410	14,508
Minimum Level	0	0	0	8,743	0	0	0	0
Wildlife	0	0	0	0	0	0	0	0
Timber W/Roads	764	4,216	3,822	2,920	0	3,870	4,070	1,972
Timber W/O Roads	0	95	304	0	3,690	0	0	0
Total	16,480	16,480	16,480	16,480	16,480	16,480	16,480	16,480

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	1	2	3	4	5	6	7	8
ROADED	1 ---------->	764	1,920	1,480	0	700	3,520	2,400	1,480
	5	764	4,311	4,126	2,920	3,690	3,780	4,070	1,972
ROADLESS	1 ---------->	15,716	14,560	15,000	16,480	15,780	12,960	14,080	15,000
	5	15,716	12,169	12,354	13,560	12,790	12,700	12,410	14,508
WILDERNESS	1 ---------->	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

	Alternatives (Acres)								
Management Emphasis*	9	10	11	12	13	14	15	16	17PA
Wilderness	16,480	0	0	0	0	0	0	16,480	0
Roadless	0	12,790	14,508	14,508	14,508	14,508	14,508	0	14,308
Minimum Level	0	0	0	0	0	0	0	0	0
Wildlife	0	0	0	0	0	0	0	0	0
Timber W/Roads	0	0	1,972	1,972	1,972	1,972	1,972	0	2,172
Timber W/O Roads	0	3,690	0	0	0	0	0	0	0
Total	16,480	16,480	16,480	16,480	16,480	16,480	16,480	16,480	16,480

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	9	10	11	12	13	14	15	16	17PA
ROADED	1 ---------->	0	700	1,480	1,480	1,480	1,480	1,480	0	1,240
	5	0	3,690	1,972	1,972	1,972	1,972	1,972	0	2,172
ROADLESS	1 ---------->	0	15,780	15,000	15,000	15,000	15,000	15,000	0	15,240
	5	0	12,790	14,508	14,508	14,508	14,508	14,508	0	14,308
WILDERNESS	1 ---------->	16,480	0	0	0	0	0	0	16,480	0
	5	16,480	0	0	0	0	0	0	16,480	0

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

- Grizzly bear, elk, and other wildlife species would have increased security.
- Diversity would tend towards climax vegetation but could be maintained near current levels if successful fire management programs were implemented.
- Water quality and fisheries quality would be maintained at natural levels.
- Local employment and income would decrease due to a reduced timber base and reduced nonwilderness recreational opportunities.
- All nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values would be provided.

The economic and social effects would be greatest in Alternatives 9 and 16 which designate all this roadless area to wilderness. The future capacity of the Forest to produce timber and accomodate recreation use would be reduced more than in other alternatives, and maximum displacement of existing uses would occur.

b. Designation: Nonwilderness
Management Emphasis: Roadless

Alternatives 9 and 16 designate no acres to these prescriptions. Other alternatives designate from 29 to 95 percent of the roadless area to roadless management. The Preferred Alternative designates 87 percent of the inventoried area to roadless. This designation maintains a continuing roadless resource in the area.

The effect of the roadless designation is to maintain the roadless resource by establishing that management objective. Other resources are managed subject to different degrees depending on the recreation or wildlife habitat objectives of local areas. Modification of natural systems to accommodate multiple-use objectives is most noticeable when trails, campsites, or other recreation facilities are constructed and maintained. Vegetation management practices for wildlife habitat or other purposes may involve prescribed burning. Motorized equipment, such as chainsaws, helicopters, motorbikes, and snowmobiles are often used to facilitate cost-efficient management or maintenance activities or as part of the recreation opportunities. Although these activities or uses affect wilderness attributes at the time of implementation, they are short-term effects and the wilderness attributes could be easily reclaimed by eliminating this use and allowing vegetation to regrow.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be maintained.
- Grizzly bear and other wildlife security will be maintained.
- Diversity will be maintained at current or higher levels.

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- Water quality and fisheries quality would be maintained at natural levels.
- Employment and income from woods products will not be provided.
- Many nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values would be provided.

The roadless resource could be impacted by exploration and development of mineral resources. This resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. The Bureau of Land Management is the final authority for Federal mineral management. The probability of roading and development in this area is remote. If such development is proposed and implemented, it would be integrated into surface resource management to the extent that is reasonable. The most probable mineral development in this area is oil and gas. Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling. The probability of occurrence sharply diminishes with each step.

Although these activities would be mitigated to be consistent with roadless management objectives, some of the nonpriced components would be affected in the field development stage as follows:

- Existing visual conditions may be temporarily lowered.
- Introduction of roads and exploration activities adversely affect the quality of the recreation setting.
- Wildlife security would be reduced and temporary displacement from normal seasonal ranges may occur.
- Employment and income from the oil and gas resources would be provided.

c. **Designation: Nonwilderness**
Management Emphasis: Minimum Level

The effect of this prescription is to "do nothing" except to maintain existing improvements and resources. In alternatives which designate large contiguous areas to this prescription, no developments would occur due to surface resources. For alternatives which designate small areas which are not contiguous, the management direction may provide for roads to cross these areas to support management objectives of adjacent management units. The geographic configurations of the designations in each alternative determine the effects minimum management may have on wilderness attributes.

Alternative 4 designates 53 percent of the roadless area to this prescription to minimize costs and maximize revenues. These areas are the lands between the suitable timberlands and the ridge top recreation trails.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive and primitive recreation opportunities will be available but not by management design.
- Grizzly bear and other wildlife species will have security maintained but not assured, due to an absence of management objectives for the area.
- Diversity would tend toward climax species.
- Water quality and fisheries would not be affected by management activities.
- Minimum contribution to employment and income would result as there will be no comodity outputs and only incidental recreation use.
- Many nonpriced wilderness benefits may still be provided by this management prescription since only minimum cost care taking activities, such as fire protection, would affect the land.

d. Designation: Nonwilderness
Management Emphasis: Timber With Roads

The physical character of the roadless area is high elevation alpine ridges not capable of commercial timber production forming the bulk of the area, with lower elevation fringe areas and stringers of potentially suitable timberlands. As a result, these acres are usually at the end of local roads accessing adjacent suitable roaded areas. Implementation would proceed rather slowly over a period of 50 years with only about one-fifth of the area accessed in Decade 1.

Thus, most of the contiguous roadless areas will have future opportunities to be evaluated for inclusion in the National Wilderness Preservation System with slightly reduced areas where timber management activities have been implemented. There are no significant intrusions of suitable timber designations in the Coal Ridge area which would result in disection of the existing roadless area so that the contiguous roadless area criteria could no longer be met.

Alternatives 1-4, 6, 7, 8, 11-16, and 17 designate a portion of the area to timber management emphasis prescriptions. The consequence of these designations is a loss of wilderness attributes at the time of implementation of timber harvest or support activities requiring roads. The roadless resource and wilderness attributes of natural integrity, natural appearance, opportunity for solitude, and primitive recreation are foregone when these management prescriptions are implemented.

The nonpriced components are affected as follows:

- Visual quality will be modification or maximum modification where man's activities will dominate the landscape.
- Semiprimitive nonmotorized and wilderness recreation attributes would be foregone within 50 years.
- Elk security and big-game hunting opportunities would be reduced but mitigated through road-use management depending on site-specific needs.

- Diversity would be improved and nongame wildlife would be maintained.
- Water quality and fisheries would be adversely affected but mitigated through the use of "Best Management Practices."
- Local economic stability would be provided by supporting the highest level of wood products industry jobs.

These prescriptions provide for a wide range of multiple-use benefits both priced and nonpriced. The flow of these benefits components in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices.

e. **Designation: Nonwilderness**
Management Emphasis: Timber Without Roads

Minor fringe areas suitable for timber are designated as this prescription in alternatives 2, 3, 5, and 10. Those designations are areas with commercial timber potential on steep, rugged terrain mostly within 1 mile of a road. Logging would employ aerial yarding systems, and no roads would be constructed. Implementation would impact the vegetation and would not reach long distances into roadless areas. Since the land itself would not be changed, wilderness attributes could be easily reclaimed after implementation by vegetative regrowth.

Implementation would proceed slowly for all alternatives designating these prescriptions. No areas would be affected in Decades 1 and 2. Harvesting would occur by Decade 5 when economic efficiency of the prescription are projected to be best. The prescription would not have significant economic or social effect changes.

The nonpriced components are as follows:

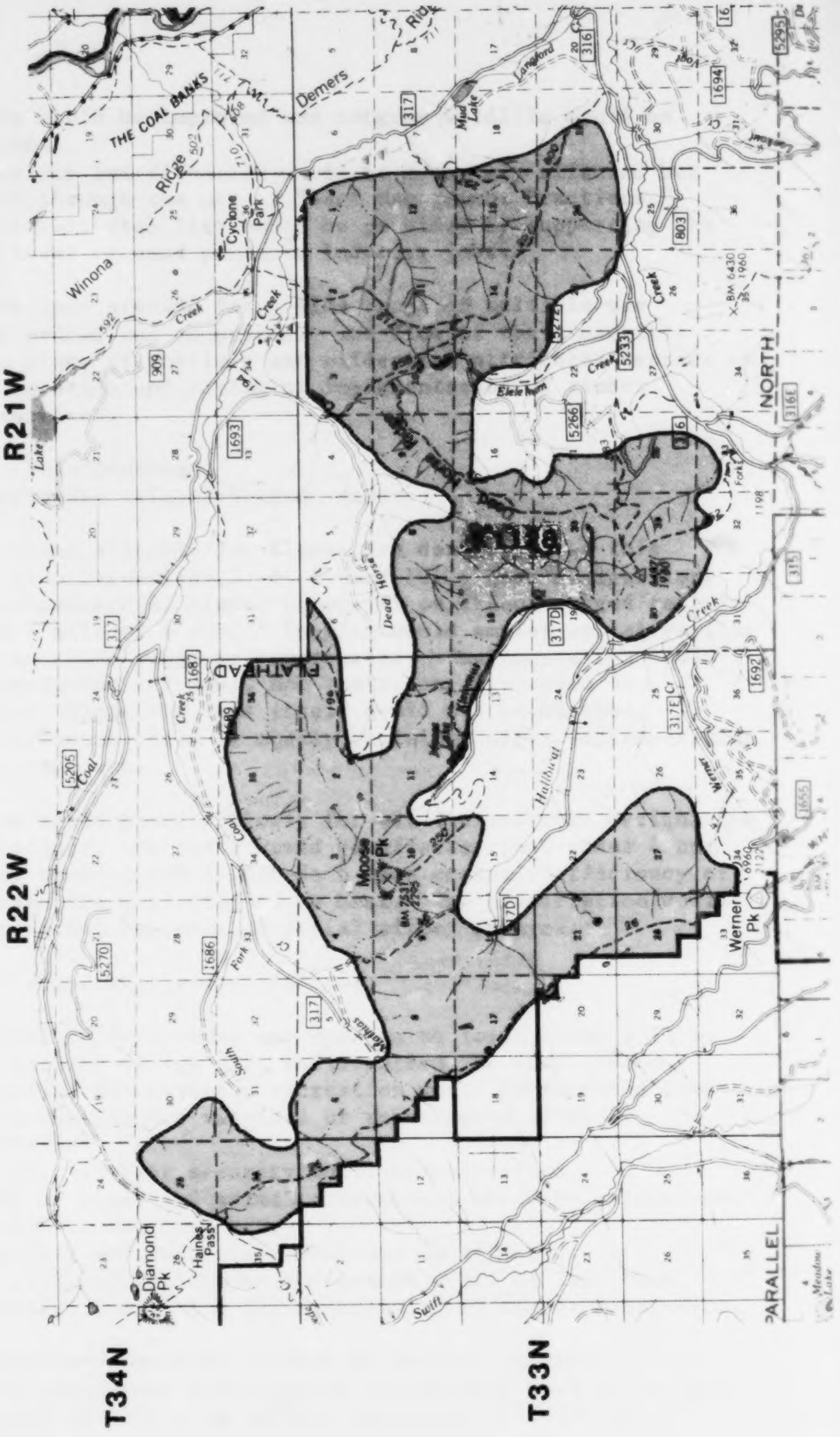
- Visual quality objectives appropriate to local areas will be part of project design with modification the most common.
- Semiprimitive nonmotorized recreation would be provided with wilderness attributes retained or recoverable after implementation.
- Elk and grizzly bear security would be maintained.
- Diversity of plant and animal communities would be maintained or improved in the long term.
- Water quality and fisheries would not be affected.
- Support of local employment and income would be less than timber roaded due to the lower intensity of timber management.

Oil and gas activity would be limited to seismic surveys because all slopes in this management prescription are greater than 60 percent. All areas leased contain a no-surface occupancy stipulation.

DEADHORSE RIDGE

X1128

ROADLESS AREA


R21W
R22W
T34N
T33N
THE COAL BANKS
Demers Ridge
Winona
Cyclone Park
Mud Lake
Langford
Creek
Elelehorn Creek
Dead Horse
FLATHEAD
Coal Creek
Smith Fork
Hallowat
Moose Pk
Werner Pk
Diamond Pk
Haines Pass
Swift
NORTH
PARALLEL
Meadow Lake
Lake
X1128
316
317
803
1694
5295
909
1693
5266
5233
317D
1692
317E
1687
1689
5205
5270
1686
315
1655
SCALE
1
0
1
3
MILES

▨ ROADLESS AREA

DEADHORSE RIDGE X1128 (RARE I No. 00128) - FLATHEAD NATIONAL FOREST

Total Gross Acres: 23,550 Total Net Acres: 23,550

A. DESCRIPTION

Deadhorse roadless area is located in the north end of the Flathead National Forest, 25 miles south of the Canadian border. It is one of seven roadless areas located in what is often referred to as the "North Fork." The North Fork region lies adjacent to Glacier National Park and is bordered by the North Fork of the Flathead River on the east and the Whitefish Mountain Range or Divide on the west.

This area lays east/west along ridgetops with several fingers of land penetrating north and south between drainages. It is approximately 12 miles long and varies from 1/4 to 4 miles wide. The terrain consists of predominately high, rugged ridgetops and upper slopes overlooking developed drainages. The area is covered with open coniferous forest stands with many areas of rock outcrops and some open grassy areas on very shallow soils.

This roadless area is located to the north of the Hallowat Creek and Big Creek roads. The west side borders on the Stillwater State Forest.

Access from the east is by secondary Road #210 (the North Fork Road). Western access is through the Stillwater State Forest along secondary roads and then by trail. The Whitefish Divide-Smokey Range Trail #26 touches on the western boundary of this area. The proposed Ralph Thayer National Recreation Trail runs along the western boundary of the area.

Primary ecosystems present include whitebark pine/subalpine fir on the ridgetops and subalpine fir/bear grass on the southeast or southwest aspects. Timber types vary from whitebark pine at the upper limits to Englemann Spruce at the lower limits.

Wildlife species present include elk, whitetail and mule deer, black bear, wolverine, the hoary marmot, golden eagle, and the lynx. The area is also inhabited by the grizzly bear, which is classified by the U.S. Fish and Wildlife Service as a threatened species. The lower elevation lands between Elelehum Creek and Langford Creek are significant elk/mule deer winter range.

Primary uses include hunting and hiking, with some use from snowmobiling, cross-country skiing, and camping. There are several trails that interconnect within the area. One trail (#452) runs the full length of Deadhorse Ridge. Another trail, The Ralph Thayer Memorial National Recreation Trail, skirts the western boundary from Haines Pass to Werner Peak.

B. CAPABILITY

1. NATURAL INTEGRITY AND APPEARANCE

This roadless area, as it stands, has many off site intrusions around the edges in the form of existing roads and visible cutting units.

The naturalness of the area has been disrupted by the previously mentioned trails; however, visitors to the area would feel that the greater portion maintains a natural appearance.

2. OPPORTUNITIES FOR SOLITUDE

Few opportunities for solitude exist within this area because of the generally poor vegetative and topographic screening.

3. PRIMITIVE RECREATION OPPORTUNITIES

Few opportunities for a primitive experience exist, due to the small perimeter to core distances and limited screening from the sights and sounds of man. There are several day hiking opportunities along trails within the Deadhorse Ridge area and along the Whitefish Divide Trail (#26).

4. OTHER FEATURES

The area is considered to have good scenic value due to its panoramic views into Glacier National Park from the ridges.

5. MANAGEABILITY AND BOUNDARIES

The area was inventoried and evaluated in RARE I and the 1974 North Fork Planning Unit EIS. As planned by the North Fork Unit Plan, the size of the roadless area has been reduced by timber management activities from the 8,960 acres inventoried in RARE I to the current 6,490 acres. Boundaries of the current roadless area would be difficult to manage as a wilderness unit because they are not delineated by permanent features.

C. AVAILABILITY

1. RESOURCE POTENTIALS

The discussion that follows refers to significant resources present within this roadless area other than the previously discussed wilderness resource. The chart on the following page summarizes the existing resource potential for this roadless area.

Wildlife

This area is within Situation 1 grizzly bear habitat, which is vital to the survival and recovery of the species from its threatened status.

Wildlife presence and values in this area are diverse. The area is used as a noncritical summer range by big-game species. Various furbearers and nongame species also inhabit the area. No specific critical wildlife habitat needs have been identified in this area.

DEADHORSE RIDGE ROADLESS AREA (X1128)

Category	Unit	
Gross Acres	Acres	23,550
Net Acres	Acres	23,550
Recreation		
Primitive	RVD's	0
Semiprim. Nonmotor	RVD's	360
Semiprim. Motor.	RVD's	160
Roaded Natural	RVD's	480
Range		
Existing Obligated		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Existing Vacant		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Proposed		
Suitable	Acres	0
AUM's	AUM's	0
Timber		
Tentative Suitable	Acres	8,178
Standing Volume	MBF	45,791
Corridors		
Exist. & Potential	No.	0
Wildlife - T&E		
Grizzly Bear Habitat		
Situation 1	Acres	23,550
Situation 2	Acres	0
Situation 3	Acres	0
Gray Wolf Habitat	Acres	0

Category	Unit	
Wildlife - Big Game		
Summer Habitat	Acres	0
Winter Habitat	Acres	0
Significant Fisheries		
Stream Miles	Miles	0
Stream Habitat	Hab. Ac.	0
Lakes	No.	1
Lake Habitat	Hab. Ac.	211
Water Developments		
Existing	No.	0
Minerals		
Hardrock Potential		
Very High	Acres	0
High	Acres	0
Moderate	Acres	0
Low	Acres	23,550
Mining Claims	No.	0
Oil & Gas Potential		
Very High	Acres	0
High	Acres	23,550
Moderate	Acres	0
Low	Acres	0
Oil & Gas Leases		
Leases	No.	23
Leased Area	Acres	23,550

Minerals

This area is within the Montana Overthrust Belt. The area is rated as having high oil and gas potential. The entire area has existing oil and gas leases in effect, and there is continuous seismic investigation in this area. Hardrock mineral potential is considered to be low.

Timber

Whitebark pine and alpine larch is a long-lived species and is a major stand component above 6,000 feet in elevation. In 1978 the lodgepole pine and whitebark pine in the roadless area began experiencing an epidemic infestation of mountain pine beetle. Between 1978 and 1982, this insect had spread throughout the lodgepole pine and whitebark pine stands resulting in moderate mortality throughout this roadless area. The spruce bark beetle is active in the portions of the area. This mortality results in a buildup of ground fuel and greatly increases the risk of large wildfires.

There are approximately 8,178 acres of potentially suitable timberlands included in this area. Most of these stands are on steep slopes and timber management costs are generally high.

Recreation

Recreation uses include primarily hunting, with some use from snowmobiling, cross-country skiing, and camping. Current recreational use is from local residents primarily. The overall use for this area is considered to be moderate.

Land Use Authorizations

There are no private inholdings or special uses within the interior of this area. There is no potential for domestic grazing.

2. MANAGEMENT CONSIDERATIONS

Moderate to high risks would be involved in containing natural forces of fire or insect and disease outbreaks within the areas. The area offers outstanding grizzly bear research opportunities.

The area offers outstanding grizzly research opportunities.

D. NEED

1. PROXIMITY TO DESIGNATED WILDERNESSES AND TO POPULATION CENTERS

Refer to Table C-1, Part A and B for proximity data. In addition to the National Forest Wilderness and Roadless Areas listed in the table, the Deadhorse Ridge area is located just a few miles west of the 1,000,000 acre Glacier National Park. A large part of Glacier National Park is currently being studied for wilderness classification. Additional roadless/wilderness areas are available in Canada in the form of Provincial Parks and Forests within 100 miles of Flathead National Forest. The relatively small amount of current recreational use the area receives is attributed to the fact that an abundance of high quality wilderness opportunities exist in the Forest zone of influence along with the fact that the Deadhorse Ridge area is not well known in population centers. Current use is primarily from local residents.

2. CONTRIBUTION TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM

The vegetative habitat types, plant species, most animal species, and geologic types known to exist in this area are well represented in existing wilderness areas. This area does have the potential to contribute to grizzly bear/gray wolf recovery.

3. PUBLIC INTERESTS

Expressed public need and support for wilderness classification of this area is low. The public had opportunity to comment in the 1974 Unit Plan, and in September 1983 when the area was reevaluated in the Forest planning process.

The public was given an opportunity to again comment on classification of this roadless area when the DEIS Supplement was released for public review in November of 1984. Again public support for wilderness designation of the area was low. Primarily the commenters were concerned over the possible loss of motorized recreation opportunities.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENT BY ALTERNATIVE

The estimated acres of management emphasis for the Deadhorse Ridge roadless area are displayed in the following tabulation for all 17 Forest Plan Alternatives. The roadless area would be managed differently in the various alternatives in order to contribute appropriately to meeting Forest objectives in each case. The designations are summarized below by management emphasis.

2. IMPACTS

a. Designation: Wilderness
Mangement Emphasis: Wilderness

Alternative 9 designates 100 percent of the roadless area to wilderness. Wilderness designation will preserve or enhance wilderness attributes.

Current uses which may not conform with wilderness management include oil and gas leasing. All of the 23,550 acres have been leased. No timber harvest would be permitted. Current contracts for oil and gas

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

	Alternatives (Acres)							
Management Emphasis*	1	2	3	4	5	6	7	8
Wilderness	0	0	0	0	0	0	0	0
Roadless	20,313	14,460	15,020	16,137	13,315	14,980	16,480	15,758
Minimum Level	0	0	0	0	1,660	0	0	0
Wildlife	0	0	0	0	0	0	0	0
Timber W/Roads	3,237	9,019	7,985	7,413	8,575	8,570	7,070	7,792
Timber W/O Roads	0	71	545	0	0	0	0	0
Total	23,550	23,550	23,550	23,550	23,550	23,550	23,550	23,550

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	1	2	3	4	5	6	7	8
ROADED	1 ---------->	500	1,080	720	0	500	2,020	1,620	720
	5	3,237	9,090	8,530	7,413	8,575	8,570	7,070	7,792
ROADLESS	1 ---------->	23,050	22,470	22,830	23,550	23,050	21,530	21,930	22,830
	5	20,313	14,460	15,020	16,137	14,975	14,980	16,480	15,758
WILDERNESS	1 ---------->	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

	Alternatives (Acres)								
Management Emphasis*	9	10	11	12	13	14	15	16	17PA
Wilderness	23,550	0	0	0	0	0	0	0	0
Roadless	0	13,315	15,758	15,758	15,758	15,758	15,758	20,313	16,198
Minimum Level	0	1,660	0	0	0	0	0	0	0
Wildlife	0	0	0	0	0	0	0	0	0
Timber W/Roads	0	8,575	7,792	7,792	7,792	7,792	7,792	3,237	7,352
Timber W/O Roads	0	0	0	0	0	0	0	0	0
Total	23,550	23,550	23,550	23,550	23,550	23,550	23,550	23,550	23,550

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	9	10	11	12	13	14	15	16	17PA
ROADED	1 ---------->	0	500	720	720	720	720	720	500	720
	5	0	8,575	7,792	7,792	7,792	7,792	7,792	3,237	7,352
ROADLESS	1 ---------->	0	23,050	22,830	22,830	22,830	22,830	22,830	23,050	22,830
	5	0	14,975	15,758	15,758	15,758	15,758	15,758	20,313	16,198
WILDERNESS	1 ---------->	23,550	0	0	0	0	0	0	0	0
	5	23,550	0	0	0	0	0	0	0	0

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

leases, special uses, or grazing would probably be permitted to run their course with emphasis on contract administraton to protect wilderness attributes. Oil and gas exploration and development costs will be increased.

The nonpriced components are affected as follows:

- Visual quality would be preserved.
- National Wilderness Preservation System lands will increase.
- Grizzly bear, elk, and other wildlife species would have increased security.
- Diversity would tend towards climax vegetation. This would depend on what type of fire management programs were implemented.
- Water quality and fisheries quality would be maintained at natural levels.
- Local employment and income would decrease due to a reduced timber base and reduced nonwilderness recreational opportunities.
- All nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values will be provided.

The economic and social effects would be greatest on Alternative 9 which designates all the roadless area to wilderness. The future capacity of the Forest to produce timber and accommodate recreation use would be reduced more than in other alternatives, and maximum displacement of existing uses would occur.

b. **Designation: Nonwilderness**
Management Emphasis: Roadless

Alternative 9 designates no acres to these prescriptions. Other alternatives range from 57 to 86 percent of the roadless area to roadless management. The Preferred Alternative designates 69 percent of the inventoried area to roadless. This designation maintains a continuing roadless resource in the area.

The effects of the roadless designation is to maintain the roadless resource by establishing that management objective. Other resources are managed subject to the primary roadless objective. Wilderness attributes may be affected differently depending on the recreation or wildlife habitat objectives of local areas. Modification of natural systems to accommodate multiple-use objectives is most noticeable when trails, campsites, or other recreation facilities are constructed and maintained.

Vegetation management practices for wildlife habitat or other purposes may involve prescribed burning. Motorized equipment, such as chainsaws, helicopters, motorbikes, and snowmobiles, are often used to facilitate cost-efficient management or maintenance activities or as part of the recreation opportunities. Although these activities or uses affect wilderness attributes at the time of implementation, they are short-term effects and the wilderness attributes could be easily reclaimed by eliminating this use and allowing vegetation to regrow.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be maintained.
- Grizzly bear and other wildlife security will be maintained.
- Diversity will be maintained at current or higher levels.
- Water quality and fisheries quality would be maintained or improved through management.
- Employment and income from wood products will not be provided.
- Many nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values would be provided.

The roadless resource could be impacted by exploration and development of mineral resources. This resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. The Bureau of Land Management is the final authority for Federal mineral management. The probability of roading and development in this area is remote. If such development is proposed and implemented, it would be integrated into surface resource management to the extent that is reasonable. The most probable mineral development in this area is oil and gas. Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling. The probability of occurrence sharply diminishes with each step.

Although these activities would be mitigated to be consistent with roadless management objectives, some of the nonpriced components would be affected in the field development stage as follows:

- Existing visual conditions may be temporarily lowered.
- Introduction of roads and exploration activities adversely affect the quality of the recreation setting.
- Wildlife security would be reduced and temporary displacement from normal seasonal ranges may occur.
- Employment and income from the oil and gas resources would be provided.

c. **Designation: Nonwilderness**
Management Emphasis: Minimum Level

This emphasis requires no management activities except to maintain existing improvements and resources. In alternatives which designate large continuous areas to this prescription, no developments would occur due to surface resources. For alternatives which designate small areas which are not contiguous, the management direction may provide for roads to cross these areas to support management objectives of the adjacent management units. The geographic configurations of the designations in each alternative determines the effects minimum management may have on wilderness attributes.

Alternatives 5 and 10 designate only small isolated areas which are not needed to be managed in order to achieve the objectives of each alternative. Alternative 4 designates 51 percent of the roadless area to this prescription to minimize costs and maximize revenues. These areas are the lands between the suitable timberlands and the ridge top recreation trails.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be available but not by management design.
- Grizzly bear and other wildlife species will have security maintained.
- Diversity would tend toward climax species.
- Water quality and fisheries would not be affected by management activities.
- Minimum contribution to employment and income would result as there will be no commodity outputs and only incidental recreation use.
- Many nonpriced wilderness benefits may still be provided by this management prescription since only minimum cost care taking activities, such as fire protection, would affect the land.

d. Designation: Nonwilderness
Management Emphasis: Timber with Roads

The physical character of the roadless area consists of high elevation alpine ridges not capable of commercial timber production forming the bulk of the area, with lower elevation fringe areas of potentially suitable timberlands. As a result, these acres are at the end of local roads accessing adjacent suitable roaded areas. Implementation would proceed rather slowly over a period of 50 years with only about one-fifth of the area accessed in Decade 1. Thus, most of the contiguous roadless areas will have future opportunities to be evaluated for inclusion in the National Wilderness Preservation System with slightly reduced areas where timber management activities have been implemented. There are no significant intrusions of suitable timber designations in the Benchmark area which would result in dissection of the existing roadless area so that the contiguous roadless area criteria could no longer be met.

All alternatives, except Alternative 9 designate a portion of the area to timber management emphasis prescriptions. The consequence of these designations is a loss of wilderness attributes at the time of implementation of timber harvest or support activities requiring roads. The roadless resource and wilderness attributes of natural integrity, natural appearance, opportunity for solitude, and primitive recreation are foregone when these management prescriptions are implemented.

The nonpriced components are affected as follows:

- Visual quality will be modification or maximum modification where man's activities will dominate the landscape.
- Semiprimitive nonmotorized and wilderness recreation attributes would be foregone within 50 years.
- Elk security and big-game hunting opportunities would be reduced but mitigated through road-use management depending on site-specific needs.
- Diversity would be improved and nongame wildlife would be maintained.
- Water quality and fisheries would be adversely affected but mitigated through the use of "Best Management Practices."
- Grizzly bear habitat would be suboptimal but this would be mitigated to the extent possible according to site-specific needs.
- Local economic stability would be provided by supporting the highest level of woods products industry jobs.

These prescriptions provide for a wide range of multiple-use benefits both priced and nonpriced. The flow of these benefits in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices.

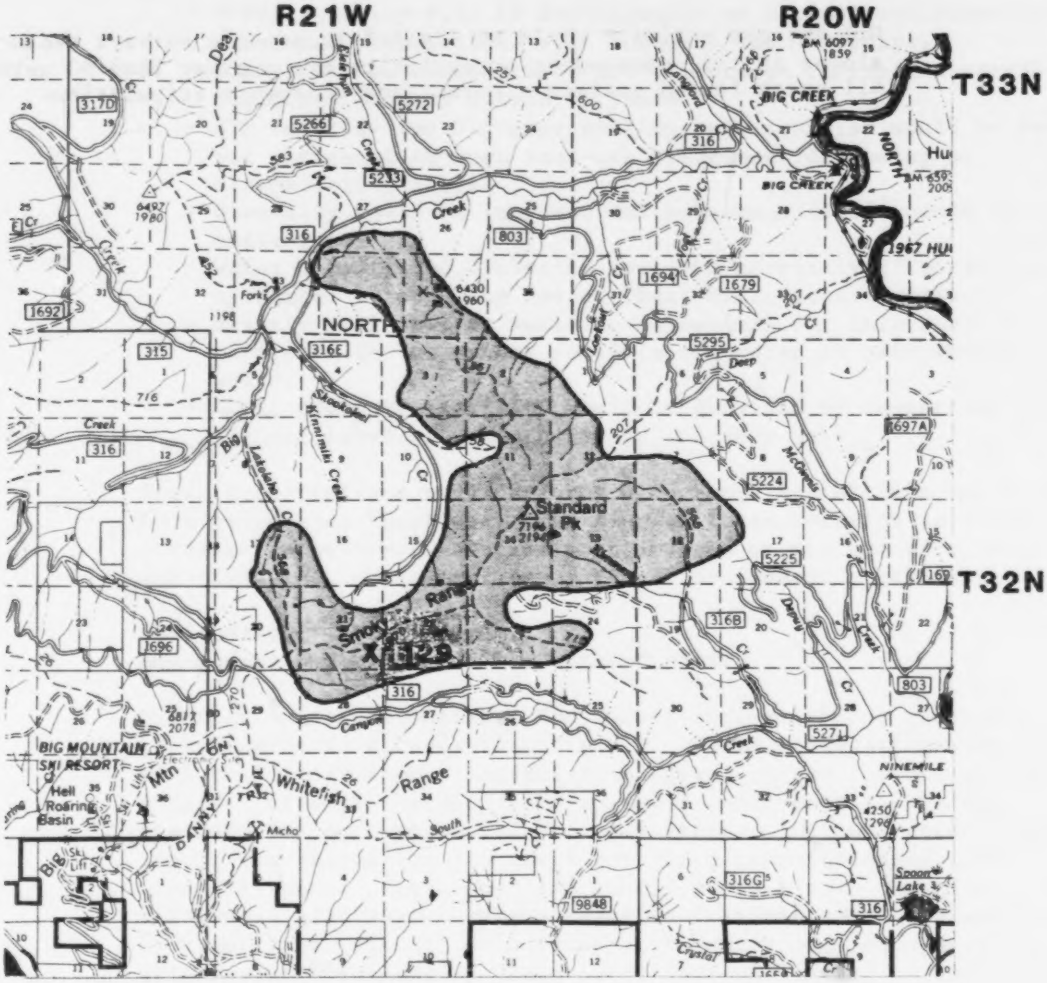
e. **Designation: Nonwilderness**
Management Emphasis: Timber Without Roads

Minor fringe areas suitable for timber are designated as this prescription in Alternatives 2 and 3. Those designations are areas with commercial timber potential on steep, rugged terrain mostly within 1 mile of a road. Logging would employ aerial yarding systems, and no roads would be constructed. Implementation would impact the vegetation and would not reach long distances into roadless areas. Since the land itself would not be changed, wilderness attributes could be easily reclaimed after implementation by vegetative regrowth. Implementation would proceed slowly for all alternatives designating these prescriptions. No areas would be affected in Decades 1 and 2. Harvesting would occur by Decade 5 when economic efficiency of the prescription is projected to be best. The prescription would not make significant economic or social effect changes.

The nonpriced components are affected as follows:

- Visual quality objectives appropriate to local areas will be part of project design with modification the most common.
- Semiprimitive nonmotorized recreation would be provided with wilderness attributes retained or recoverable after implementation.
- Elk and grizzly bear security would be maintained.
- Diversity of plant and animal communities would be maintained or improved in the long term.
- Water quality and fisheries would not be affected.
- Support of local employment and income would be less than timber roaded due to the lower intensity of timber management.

Oil and gas activity would be limited to seismic surveys because all slopes in this management prescription are greater than 60 percent. All areas leased contain a no-surface occupancy stipulation.


R21W
R20W
T33N
T32N
BIG CREEK
NORTH
Standard Pk
Smoky Range
X1129
BIG MOUNTAIN SKI RESORT
Hell Roaring Basin
Whitefish Range
NINEMILE
Spoon Lake
316
5272
5266
5233
803
1694
1679
5295
1697A
5224
5225
316B
5271
316G
9848
317D
1692
315
316E
316
1696

STANDARD PEAK

X1129

ROADLESS AREA

▨ **ROADLESS AREA**

SCALE
1
0
1
3
MILES

STANDARD PEAK X1129 (RARE I No. 00129) - FLATHEAD NATIONAL FOREST

Total Gross Acres: 7,770 Total Net Acres: 7,770

A. DESCRIPTION

Standard Peak roadless area is located in the north end of the Flathead National Forest. It is the southern most of seven roadless areas located in what is often referred to as the "North Fork." The North Fork region lies adjacent to Glacier National Park and is bordered by the North Fork of the Flathead River on the east and the Whitefish Mountain Range or Divide on the west.

This area lies east/west along the ridge between Canyon Creek and Big Creek, and surrounds Standard Peak. The terrain consists of predominately high, rugged ridgetops and upper slopes overlooking developed drainages. The area consists of open slopes and meadows with many areas of rock outcrops on very shallow soils.

This roadless area is located to the south and east of the Skookaleel Creek Road and to the north of the Canyon Creek Road. The site is totally within Flathead County and is primarily surrounded by roaded timber management lands.

Access from the east is by secondary roads off Road #210 (the North Fork Road). Western access is through the Stillwater State Forest along secondary roads and then by trail.

Primary ecosystems present include whitebark pine/subalpine fir on the ridgetops, and subalpine fir/bear grass on the southeast to southwest aspects. Timber types vary from whitebark pine at the upper limits to Engelmann spruce at the lower limits.

Wildlife species present include elk, whitetail deer, mule deer, black bear, wolverine, the hoary marmot, golden eagle, and the lynx. The area is also inhabited by the grizzly bear, which is classified by the U.S. Fish and Wildlife Service as a threatened species. The area is part of a significant grizzly bear corridor that reaches from Apgar Mountain in Glacier National Park to the Whitefish Divide.

Primary uses include hunting and hiking, with some use from snowmobiling, cross-country skiing, and camping. There are several trails that interconnect within the area providing excellent day hiking opportunities through alpine country.

B. CAPABILITY

1. NATURAL INTEGRITY AND APPEARANCE

This roadless area, as it stands, has many off-site intrusions around the edges in the form of existing roads and visible cutting units. Visitors to the area would feel that the greater portion maintains a natural appearance because the intrusions are not generally visible until reaching Standard Peak. From there the Smokey Range Trail and remnants of the old lookout can also be seen.

2. OPPORTUNITIES FOR SOLITUDE

Only a few opportunities for solitude exist within this area. The distance from perimeter to core is short with generally poor to moderate vegetative screening and poor topographic screening.

3. PRIMITIVE RECREATION OPPORTUNITIES

Few opportunities for a truly primitive experience exist, due to the areas small size and limited screening.

4. OTHER FEATURES

The area is considered to have good scenic value due to the panoramic views into Glacier National Park, the Flathead Valley, and the Cabinet Mountains from the ridges.

5. MANAGEABILITY AND BOUNDARIES

The area was inventoried and evaluated in RARE I and in the 1974 North Fork Planning Unit EIS.

As planned by the North Fork Unit Plan, the size of the roadless area has been reduced by timber management activities from the 10,547 acres inventoried in RARE I to the current 7,770 acres. Boundaries are irregular due to existing timber harvest and road patterns and they do not follow permanent features. The boundaries, as currently inventoried, would be difficult to manage as a wilderness unit.

C. AVAILABILITY

1. RESOURCE POTENTIALS

The discussion that follows refers to significant resources present within this roadless area other than the previously discussed wilderness resource. The chart on the following page summarizes the existing resources of this roadless area.

Wildlife

This area is within Situation 1 grizzly bear habitat, which is very important to survival and recovery of the species from its threatened status. The primary role of this area to grizzly bear in the North Fork is that of providing a travel corridor from Glacier Park to the Whitefish Divide. The high ridge from Standard Peak east toward Huckleberry Mountain in Glacier National Park provides a natural corridor for bear travel.

Minerals

This area is within the Montana Overthrust Belt. The area is rated as having high oil and gas potential. The entire area has existing oil and gas leases in effect, and there is continuous seismic investigation in this area. Hardrock mineral potential is considered to be low.

STANDARD PEAK ROADLESS AREA (X1129)

Category	Unit	
Gross Acres	Acres	7,770
Net Acres	Acres	7,770
Recreation		
Primitive	RVD's	0
Semiprim. Nonmotor	RVD's	0
Semiprim. Motor.	RVD's	443
Roaded Natural	RVD's	307
Range		
Existing Obligated		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Existing Vacant		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Proposed		
Suitable	Acres	0
AUM's	AUM's	0
Timber		
Tentative Suitable	Acres	2,991
Standing Volume	MBF	26,402
Corridors		
Exist. & Potential	No.	0
Wildlife - T&E		
Grizzly Bear Habitat		
Situation 1	Acres	7,770
Situation 2	Acres	0
Situation 3	Acres	0
Gray Wolf		
Habitat	Acres	0

Category	Unit	
Wildlife - Big Game		
Summer Habitat	Acres	0
Winter Habitat	Acres	0
Significant Fisheries		
Stream Miles	Miles	0
Stream Habitat	Hab. Ac.	0
Lakes	No.	0
Lake Habitat	Hab. Ac.	0
Water Developments		
Existing	No.	0
Minerals		
Hardrock Potential		
Very High	Acres	0
High	Acres	0
Moderate	Acres	0
Low	Acres	7,770
Mining Claims	No.	0
Oil & Gas Potential		
Very High	Acres	0
High	Acres	7,770
Moderate	Acres	0
Low	Acres	0
Oil & Gas Leases		
Leases	No.	7
Leased Area	Acres	7,770

Timber

Whitebark pine and alpine larch are long-lived species and are major stand components above 6,000 feet in elevation. In 1978 the lodgepole pine and whitebark pine in the roadless area began experiencing an epidemic infestation of mountain pine beetle. Between 1978 and 1982, this insect had spread throughout the lodgepole pine and whitebark pine stands resulting in moderate mortality throughout this roadless area. The spruce bark beetle is active in the portions of the area. This mortality results in a buildup of ground fuel and greatly increases the risk of large wildfires.

There are approximately 2,991 acres of potentially suitable timberlands included in the area. Most of these stands are on steep slopes and timber management costs are generally high.

Recreation

Recreation uses include primarily hunting with some use from snowmobiling, cross-country skiing and camping. Hiking and horseback use along the trails over Standard Peak is also significant. Proximity to the community of Columbia Falls gives the area excellent opportunities for day-hike outings.

Land Use Authorizations

There are no private inholdings or special uses within the interior of this area. There is no potential for domestic grazing.

2. MANAGEMENT CONSIDERATIONS

Moderate to high risks would be involved in containing natural forces of fire or insect and disease outbreaks within the area.

D. NEED

1. PROXIMITY TO DESIGNATED WILDERNESSES AND TO POPULATION CENTERS

Refer to Table C-1, Parts A and B for proximity data. In addition to the National Forest wilderness and roadless areas listed in the table, the Standard Peak area is located just a few miles west of the 1,000,000 acre Glacier National Park. A large part of Glacier National Park is currently being studied for wilderness classification. Additional roadless and wilderness areas are available in Canada in the form of Provincial Parks and Forests within 100 miles of Flathead National Forest. The relatively small amount of current recreational use the area receives is attributed to the fact that an abundance of high quality wilderness opportunities exist in the forest zone of influence along with the fact that the Standard Peak area is not well known in population centers. Current use is primarily from local residents.

2. CONTRIBUTION TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM

The vegetative habitat types, plant species, most animal species, and geologic types known to exist in this area are well represented in existing wilderness areas. This area does have the potential to contribute to grizzly bear/gray wolf recovery.

3. PUBLIC INTERESTS

The public had opportunity to comment in the 1974 unit plan and in September 1983 when the area was reevaluated in the Forest planning process. Expressed public need and support for wilderness classificaton of this area is low.

The public was given an opportunity to again comment on classification of this roadless area when the DEIS Supplement was released for public review in November of 1984. Again public support for wilderness designation of the area was low. The commenters were concerned over the loss of motorized recreation opportunities, primarily snowmobiling.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENT BY ALTERNATIVE

The estimated acres of management emphasis for the Standard Peak roadless area are displayed in the following tabulation for all 17 Forest Plan Alternatives. The roadless area would be managed differently in the various alternatives in order to contribute appropriately to meeting Forest objectives. The designations are summarized below by management emphasis.

2. IMPACTS

a. Designation: Wilderness
Management Emphasis: Wilderness

Alternatives 9 designates 100 percent of this roadless area to wilderness. Wilderness designation will preserve or enhance wilderness attributes.

Current uses which may not conform with wilderness management include oil and gas leasing. All of the 7,770 acres have been leased. No timber harvest would be permitted.

Current contracts for oil and gas leases would be permitted to run their course with emphasis on contract administration to protect wilderness attributes. Oil and gas exploration and development costs would increase.

The nonpriced components are affected as follows:

- Visual quality would be preserved.
- National Wilderness Preservation System lands will increase.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

	Alternatives (Acres)							
Management Emphasis*	1	2	3	4	5	6	7	8
Wilderness	0	0	0	0	0	0	0	0
Roadless	6,575	6,432	6,167	682	5,103	6,030	5,460	6,526
Minimum Level	0	0	20	5,423	1,562	0	0	0
Wildlife	0	0	0	0	0	0	0	0
Timber W/Roads	1,195	1,271	1,519	1,603	740	1,740	2,310	1,244
Timber W/O Roads	0	67	64	62	365	0	0	0
Total	7,770	7,770	7,770	7,770	7,770	7,770	7,770	7,770

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	1	2	3	4	5	6	7	8
ROADED	1 ---------->	0	1,338	920	0	0	1,740	1,520	920
	5	1,195	1,338	1,603	1,665	1,105	1,740	2,310	1,225
ROADLESS	1 ---------->	7,770	6,432	6,850	7,770	7,770	6,030	6,250	6,850
	5	6,575	6,432	6,167	6,105	6,665	6,030	5,460	6,545
WILDERNESS	1 ---------->	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

	Alternatives (Acres)								
Management Emphasis*	9	10	11	12	13	14	15	16	17PA
Wilderness	7,770	0	0	0	0	0	0	0	0
Roadless	0	5,103	6,526	6,526	6,526	6,526	6,526	6,575	6,456
Minimum Level	0	1,562	0	0	0	0	0	0	0
Wildlife	0	0	0	0	0	0	0	0	0
Timber W/Roads	0	740	1,244	1,244	1,244	1,244	1,244	1,195	1,314
Timber W/O Roads	0	365	0	0	0	0	0	0	0
Total	7,770	7,770	7,770	7,770	7,770	7,770	7,770	7,770	7,770

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	9	10	11	12	13	14	15	16	17PA
ROADED	1 ---------->	0	0	920	920	920	920	920	0	920
	5	0	1,105	1,244	1,244	1,244	1,244	1,244	1,195	1,314
ROADLESS	1 ---------->	0	7,770	6,850	6,850	6,850	6,850	6,850	7,770	6,850
	5	0	6,665	6,526	6,526	6,526	6,526	6,526	6,575	6,456
WILDERNESS	1 ---------->	7,770	0	0	0	0	0	0	0	0
	5	7,770	0	0	0	0	0	0	0	0

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

- Grizzly bear, elk, and other wildlife species would have increased security.
- Diversity would tend towards climax vegetation but could be maintained near current levels if successful fire management programs were implemented.
- Water quality and fisheries quality would be maintained at natural levels.
- Local employment and income would decrease due to a reduced timber base and reduced nonwilderness recreational opportunities.
- All nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values would be provided.

The economic and social effects would be greatest in Alternative 9 which designates all the roadless area to wilderness. The future capacity of the Forest to produce timber and accomodate recreation use would be reduced more than in other alternatives, and maximum displacement of existing uses would occur.

b. **Designation: Nonwilderness**
Management Emphasis: Roadless

Alternative 9 designates no acres to these prescriptions. Other alternatives designate from 9 to 85 percent of the roadless area to roadless management. The Preferred Alternative designates 83 percent of the inventoried area to roadless. This designation maintains a continuing roadless resource in the area.

The effect of the roadless designation is to maintain the roadless resource by establishing that management objective. Other resources are managed subject to the primary roadless objective. Wilderness attributes may be affected differently depending on the recreation or wildlife habitat objectives of local areas. Modification of natural systems to accommodate multiple-use objectives is most noticeable when trails, campsites, or other recreation facilities are constructed and maintained.

Vegetation management practices for wildlife habitat or other purposes may involve prescribed burning. Motorized equipment, such as chainsaws, helicopters, motorbikes, and snowmobiles, are often used to facilitate cost-efficient management or maintenance activities or as part of the recreation opportunities. Although these activities or uses affect wilderness attributes at the time of implementation, they are short-term effects and the wilderness attributes could be easily reclaimed by eliminating this use and allowing vegetation to regrow.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be maintained.

- Grizzly bear and other wildlife security will be maintained.
- Diversity will be maintained at current or higher levels.
- Water quality and fisheries will be maintained or improved through management.
- Employment and income from woods products will not be provided.
- Many nonpriced benefits of wilderness such as spiritual values, gene pool, and other scientific values and natural appearance will be provided.

The roadless resource could be impacted by exploration and development of mineral resources. This resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. The Bureau of Land Management is the final authority for Federal mineral management. The probability of roading and development in this area is remote. If such development is proposed and implemented, it would be integrated into surface resource management to the extent that is reasonable. The most probable mineral development in this area is oil and gas. Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling. The probability of occurrence sharply diminishes with each step.

Although these activities would be mitigated to be consistent with roadless management objectives, some of the nonpriced components would be affected in the field development stage as follows:

- Existing visual conditions may be temporarily lowered.
- Introduction of roads and exploration activities adversely affect the quality of the recreation setting.
- Wildlife security would be reduced and temporary displacement from normal seasonal ranges may occur.
- Employment and income from the oil and gas resources would be provided.

c. **Designation: Nonwilderness**
Management Emphasis: Minimum Level

This emphasis requires no managment activities except to maintain existing improvements and resources. In alternatives which designate large contiguous areas to this prescription, no developments would occur due to surface resources. For alternatives which designate small areas which are not contiguous, the management direction may provide for roads to cross these areas to support management objectives of adjacent management units. The geographic configurations of the designations in each alternative in relation to adjacent management units determine the effects minimum management may have on wilderness attributes.

Alternatives 3, 5, and 10 designate only small isolated areas which are not needed to be managed in order to achieve the objectives of each alternative. Alternative 4 designates 70 percent of the roadless area to this prescription to minimize costs and maximize revenues. These areas are the lands between the suitable timber lands and the ridge top recreation trails.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be available but not by management design.
- Grizzly bear and other wildlife species will have security maintained.
- Diversity would tend toward climax species.
- Water quality and fisheries would not be affected by management activities.
- Minimum contribution to employment and income would result as there will be no commodity outputs and only incidental recreation use.
- Many nonpriced wilderness benefits may still be provided by this management prescription since only minimum cost care taking activities, such as fire protection, would affect the land.

d. **Designation: Nonwilderness**
Management Emphasis: Timber With Roads

The physical character of the roadless area is high elevation alpine ridges not capable of commercial timber production forming the bulk of the area, with lower elevation fringe areas of potentially suitable timberlands. As a result, these acres are usually at the end of local roads accessing adjacent suitable roaded areas.

Implementation would proceed rather slowly over a period of 50 years with only about one-fifth of the area accessed in Decade 1. Thus, most of the contiguous roadless areas will have future opportunities to be evaluated for inclusion in the National Wilderness Preservation System with slightly reduced areas where timber management activities have been implemented.

All alternatives, except Alternative 9, designate a portion of the area to timber management emphasis prescriptions. The consequence of these designations is a loss of wilderness attributes at the time of implementation of timber harvest or support activities requiring roads. The roadless resource and wilderness attributes of natural integrity, natural appearance, opportunity for solitude, and primitive recreation are foregone when these management prescriptions are implemented.

The nonpriced components are affected as follows:

- Visual quality will be modification or maximum modification where man's activities will dominate the landscape.
- Semiprimitive nonmotorized and wilderness recreation attributes would be foregone within 50 years.
- Elk security and big-game hunting opportunities would be reduced but mitigated through road-use management depending on site-specific needs.
- Diversity would be improved and nongame wildlife would be maintained.

- Water quality and fisheries would be adversely affected but mitigated through the use of "Best Management Practices."
- Grizzly bear and gray wolf habitat would be suboptimal but mitigated to the extent possible according to site-specific needs.
- Local economic stability would be provided by supporting the highest level of woods products industry jobs.

These prescriptions provide for a wide range of multiple-use benefits both priced and nonpriced. The flow of these benefits in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices.

There are no significant intrusions of suitable timber designations in the Standard Peak area which would result in dissection of the existing roadless area so that the contiguous roadless area criteria could no longer be met.

e. **Designation: Nonwilderness**
Management Emphasis: Timber Without Roads

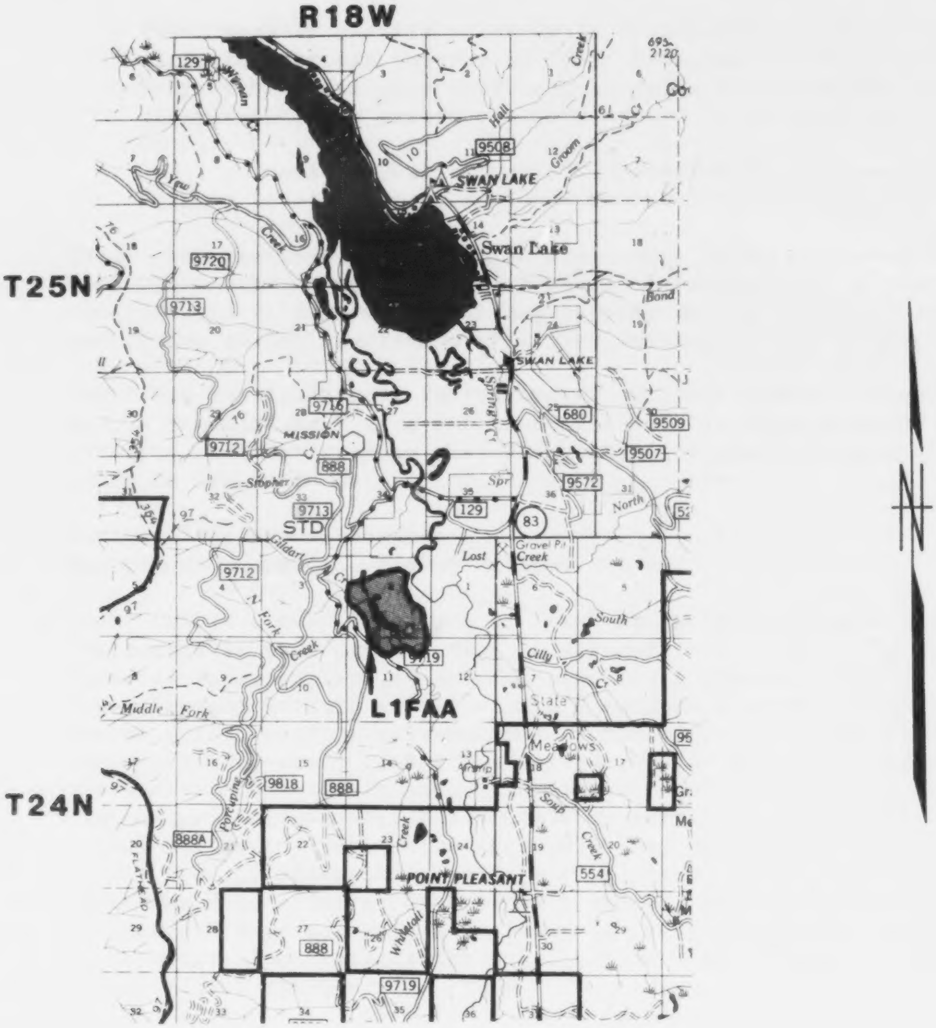
Minor fringe areas (5 percent or less) suitable for timber are designated as this prescription in Alternatives 1, 6, 7, 9, and 16. Those designations are areas with commercial timber potential on steep, rugged terrain mostly within 1 mile of a road. Logging would employ aerial yarding systems, and no roads would be constructed. Implementation would impact the vegetation and would not reach long distances into roadless areas. Since the land itself would not be changed, wilderness attributes could be easily reclaimed after implementation by vegetative regrowth. Implementation would proceed slowly for all alternatives designating these prescriptions. No areas would be affected in Decades 1 and 2. Harvesting would occur by Decade 5 when economic efficiency of the prescription is projected to be best. The prescription would not have significant economic or social effect changes.

The nonpriced components are affected as follows:

- Visual quality objectives appropriate to local areas will be part of project design with modification the most common.
- Semiprimitive nonmotorized recreation would be provided with wilderness attributes retained or recoverable after implementation.
- Elk and grizzly security would be maintained.
- Diversity of plant and animal communities would be maintained or improved in the long term.
- Water quality and fisheries would not be affected.
- Support of local employment and income would be less than timber roaded due to the lower intensity of timber management.

Oil and gas activity would be limited to seismic surveys, because all slopes in this management prescription are greater than 60 percent. All areas leased contain a no-surface occupancy stipulation.

Standard Peak
C-55


R18W
T25N
T24N
SWAN LAKE
Swan Lake
MISSION
STD
L1FAA
POINT PLEASANT
Meadows
State
83
129
9508
9720
9713
9716
9712
888
9719
9818
888A
680
9509
9507
9572
554

SWAN RIVER ISLAND

L1FAA

ROADLESS AREA

▨ **ROADLESS AREA**

SCALE
1
0
1
3
MILES

SWAN RIVER ISLAND LIFAA (RARE II NO. LIFAA) - FLATHEAD NATIONAL FOREST

Total Gross Acres: 550 Total Net Acres: 550

A. DESCRIPTION

The Swan River Island roadless area lies approximately 3 miles south of Swan Lake in the south-central portion of the Flathead National Forest. It is bordered on the east by the Swan River and on the north by private land. The southern and western boundaries are roaded timber management land.

Access to the Island area is from the east off State Highway 83 and along secondary Forest Service roads to the western boundary of the roadless area. The Island itself can be reached by hiking, however, no improved trails exist.

The site is a wet, false island characterized by a wide variety of bird life. It is flat with three high points that are less than 100 feet higher than the general island area.

A very broad range of wildlife exists within this roadless area. Wildlife species present include: white tail deer, beaver, river otter, and lynx. Grizzly bear occasionally use the area. The bald eagle inhabits the area also, and the site is popular with the local Audubon Society due to the abundant bird species.

In the center of the Island is a nearly land locked wet meadow and at the southern end the water flows past beaver dams. The Swan River and other drainage systems nearby have essentially created an island where the forest and wetlands combine to form a highly valuable ecosystem (USDA, Forest Service, 1981).

The forest vegetation types that are found here include western larch, western red cedar, and grand fir. The wetland portion supports plant communities commonly associated with rivers, ponds, and wet marshes in the Rocky Mountains.

A principal feature of the area is the contrasting life forms on the island and surrounding wet lands.

Recreation use is light. There are at least three blinds within the area used by birdwatchers and duck hunters.

B. CAPABILITY

1. NATURAL INTEGRITY AND APPEARANCE

The Swan River Island is a very natural-appearing area, and is only slightly impacted from the birdwatching and duck hunting blinds.

2. OPPORTUNITIES FOR SOLITUDE

There is very little topographic or vegetative screening from off-site intrusions, and therefore little opportunity to remove oneself from the sights and sounds of man's activities.

3. PRIMITIVE RECREATION OPPORTUNITIES

Primitive recreation opportunities do not really exist within the area due to the lack of diversity and the short distance from perimeter to core (1/2 mile or less).

4. OTHER FEATURES

The Island is considered a significant ecological feature within the Flathead National Forest, and has been nominated as a Research Natural Area.

5. MANAGEABILITY AND BOUNDARIES

Old river channels have isolated this roadless area from adjacent land creating an island ecosystem which qualifies the area for wilderness management consideration. No boundary changes have occurred.

C. AVAILABILITY

1. RESOURCE POTENTIALS

The discussion that follows refers to significant resources present within this roadless area other than the previously discussed wilderness resource. The chart on the following page summarizes the existing resource of this roadless area.

Wildlife

The most significant wildlife resource is the research opportunities provided by the unique setting and richness of plant and animal communities in the area.

Timber

The area contains some very productive timber sites but the configuration of the area is such that development costs to support harvest and management would be very high. The area offers opportunity for habitat types that are needed to complete representation of Montana habitat types in the Research Natural Area System.

Minerals

This area is within the Montana Overthrust Belt. The area is rated as having high oil and gas potential. There is continuous seismic investigation in this area. Hardrock mineral potential is considered to be low. The entire area is currently under oil and gas lease with no-surface occupancy stipulations.

Land Use Authorizations

There are no private inholdings or special uses within the interior of this area. There is no potential for domestic grazing.

SWAN RIVER ISLAND ROADLESS AREA (LIFAA)

Category	Unit	
Gross Acres	Acres	550
Net Acres	Acres	550
Recreation		
Primitive	RVD's	0
Semiprim. Nonmotor	RVD's	150
Semiprim. Motor.	RVD's	0
Roaded Natural	RVD's	0
Range		
Existing Obligated		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Existing Vacant		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Proposed		
Suitable	Acres	0
AUM's	AUM's	0
Timber		
Tentative Suitable	Acres	142
Standing Volume	MBF	641
Corridors		
Exist. & Potential	No.	0
Wildlife - T&E		
Grizzly Bear Habitat		
Situation 1	Acres	550
Situation 2	Acres	0
Situation 3	Acres	0
Gray Wolf Habitat	Acres	0

Category	Unit	
Wildlife - Big Game		
Summer Habitat	Acres	0
Winter Habitat	Acres	0
Significant Fisheries		
Stream Miles	Miles	0
Stream Habitat	Hab. Ac.	0
Lakes	No.	0
Lake Habitat	Hab. Ac.	0
Water Developments		
Existing	No.	0
Minerals		
Hardrock Potential		
Very High	Acres	0
High	Acres	0
Moderate	Acres	0
Low	Acres	550
Mining Claims	No.	0
Oil & Gas Potential		
Very High	Acres	0
High	Acres	550
Moderate	Acres	0
Low	Acres	0
Oil & Gas Leases		
Leases	No.	2
Leased Area	Acres	550

2. MANAGEMENT CONSIDERATIONS

The area could be managed as a wilderness ecosystem.

D. NEED

1. PROXIMITY TO DESIGNATED WILDERNESSES AND TO POPULATION CENTERS

Refer to Table C-1, Part A and B for proximity data. In addition to the National Forest wilderness and roadless areas listed in the table, the Swan River Island area is located just a few miles west of the Kootenai Salish Confederated Tribe's 89,500 acre Mission Mountains Tribal Wilderness which is contiguous to the USFS Mission Mountains Wilderness.

2. CONTRIBUTION TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM

While the area has significant value due to the island ecosystem, there are no vegetative habitat types, plant or animal species, or geologic types known to exist in this area that are not currently represented in existing wilderness areas.

3. PUBLIC INTERESTS

Past public involvement for the 1979 RARE II study showed most of those responding supported nonwilderness management. The final RARE II designation was nonwilderness.

The September 1983, public involvement on the current roadless inventory of the Swan River Island roadless area favored nonwilderness management.

The public was given an opportunity to again comment on classification of this roadless area when the DEIS Supplement was released for public review in November of 1984. Comments still favored nonwilderness management.

The entire area has been recommended for inclusion in the National Research Natural Area System.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENT BY ALTERNATIVE

The estimated acres of management emphasis for the Swan River Island roadless area are displayed in the following tabulation for all 17 Forest Plan Alternatives. The roadless area would be managed differently in the various alternatives in order to contribute appropriately to meeting Forest objectives. The designations are summarized below by management emphasis. These designations display how the area would be managed in each alternative if the current recommendation of the area for a Research Natural Area is not accepted.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

	Alternatives (Acres)							
Management Emphasis*	1	2	3	4	5	6	7	8
Wilderness	0	0	0	0	0	0	0	0
Roadless	0	160	210	260	0	225	0	275
Minimum Level	0	0	0	0	0	0	0	0
Wildlife	550	360	190	190	253	225	0	275
Timber W/Roads	0	30	150	100	107	100	550	0
Timber W/O Roads	0	0	0	0	190	0	0	0
Total	550	550	550	550	550	550	550	550

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	1	2	3	4	5	6	7	8
ROADED	1 ---------->	0	0	0	0	0	0	0	0
	5	0	0	150	100	107	100	0	0
ROADLESS	1 ---------->	550	550	550	550	550	550	550	550
	5	550	550	400	450	443	450	550	550
WILDERNESS	1 ---------->	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

	Alternatives (Acres)								
Management Emphasis*	9	10	11	12	13	14	15	16	17PA
Wilderness	550	0	0	0	0	0	0	0	0
Roadless	0	0	275	275	275	275	275	0	275
Minimum Level	0	0	0	0	0	0	0	0	0
Wildlife	0	253	275	275	275	275	275	550	275
Timber W/Roads	0	107	0	0	0	0	0	0	0
Timber W/O Roads	0	190	0	0	0	0	0	0	0
Total	550	550	550	550	550	550	550	550	550

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	9	10	11	12	13	14	15	16	17PA
ROADED	1 ---------->	0	0	0	0	0	0	0	0	0
	5	0	297	0	0	0	0	0	0	0
ROADLESS	1 ---------->	0	550	550	550	550	550	550	550	550
	5	0	253	550	550	550	550	550	550	550
WILDERNESS	1 ---------->	550	0	0	0	0	0	0	0	0
	5	550	0	0	0	0	0	0	0	0

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

2. IMPACTS

a. Designation: Wilderness
Management Emphasis: Wilderness

Alternative 9 designates 100 percent of the roadless area wilderness. Wilderness designation will preserve or enhance wilderness attributes.

Current uses which may not conform with wilderness management include oil and gas leasing. All of the 550 acres have been leased. No timber harvest would be permitted.

Current contracts for oil and gas leases would be permitted to run their course with emphasis on contract administration to protect wilderness attributes. Current leases have no-surface occupancy stipulations so wilderness classification would not affect exploration or development costs.

The nonpriced components are affected as follows:

- Visual quality would be preserved.
- National Wilderness Preservation System lands will increase.
- Grizzly bear, elk, and other wildlife species would have increased security.
- Diversity would tend towards climax vegetation.
- Water quality and fisheries quality would be maintained at natural levels.
- Nonpriced wilderness recreation values would be provided.
- All nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values would be provided.

The economic and social effects would be minimal due to the small area involved.

b. Designation: Nonwilderness
Management Emphasis: Roadless

Alternatives 2-4, 6, 8, 12-15, and 17 all make some designation to roadless management. These designations are usually to complement management of the unique riparian wildlife values in the area.

The effect of the roadless designation is to maintain the roadless resource by establishing a management objective of keeping the area roadless. Other resources are managed subject to the primary roadless objective. Wilderness attributes may be affected to different degrees depending on the recreation or wildlife habitat objectives of local areas. Modification of natural systems to accommodate multiple-use objectives is most noticeable when trails, campsites, or other recreation facilities are constructed and maintained. Vegetation management practices for wildlife habitat or other purposes may involve prescribed burning. Motorized equipment, such as chainsaws, helicopters, motorbikes, and snowmobiles, are often used to facilitate cost-efficient management or maintenance activities or as part of the recreation opportunities. Although these activities or uses affect wilderness attributes at the time of implementation, they are short-term effects and the wilderness attributes could be easily reclaimed by eliminating the use and allowing vegetation to regrow.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be maintained.
- Grizzly bear and other wildlife security will be maintained.
- Diversity will be maintained at current or higher levels.
- Water quality and fisheries quality would be maintained at natural levels.
- Employment and income from woods products will not be provided.
- Many nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values would be provided.

Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. The Bureau of Land Management is the final authority for Federal mineral management. The most probable mineral development in this area is oil and gas and current leases have no-surface occupancy stipulations.

c. Designation: Nonwilderness
Management Emphasis: Wildlife

All alternatives, except Alternatives 7 and 9, designate some of the roadless area to riparian wildlife in which commodity outputs or recreational use of the land is subordinate to managing the National ecosystems for wildlife habitat. Development and manipulation of vegetation may be required to achieve the habitat objectives. If such treatments involve commercial timber stands, timber harvest volume may be a byproduct of achieving or maintaining habitat objectives. The timber harvest is scheduled if the project treatments of local habitats involve enough commercial timber stands that regular periodic harvest volume can be predicted.

These prescriptions affect wilderness attributes differently than those where timber management and economics require development and a relatively high level of human activities. Due to wildlife security and cover requirements, these prescriptions require a high degree of constraints on human activities and developments. Although habitat management activities result in some reductions in wilderness attributes, compared to wilderness and roadless management prescriptions, they provide a higher level of opportunities for these amenities than management prescriptions with timber harvesting and roading as firm objectives. Opportunities for solitude and primitive recreation would be very good.

The nonpriced components are affected as follows:

- Visual quality will be appropriate to the local area as determined for individual management areas. The most common will provide modification.
- A high level of semiprimitive recreation is provided.
- Grizzly bear and other wildlife species will have a high level of security.
- Diversity and nongame species habitat would be provided.
- Water quality and fisheries habitat will be maintained or improved.

No developments are anticipated under this designation in the Swan River Island area.

d. Designation: Nonwilderness
Management Emphasis: Timber with Roads

Alternatives 2-7, and 10 make designations ranging from 100 percent to 5 percent of the area to roaded timber management. The consequences of these designations is a loss of wilderness attributes at the time of implementation of timber harvest or support activities requiring roads. The roadless resource and wilderness attributes of natural integrity, natural appearance, opportunity for solitude, and primitive recreation are foregone when these management prescriptions are implemented.

The nonpriced components are affected as follows:

- Visual quality will be modification or maximum modification where man's activities will dominate the landscape.
- Semiprimitive nonmotorized and wilderness recreation attributes would be foregone within 50 years.
- Elk security and big-game hunting opportunities would be reduced but mitigated through road-use management depending on site-specific needs.
- Diversity would be improved and nongame wildlife would be maintained.
- Water quality and fisheries would be adversely affected but mitigated through the use of "Best Management Practices".
- Local economic stability would be provided by supporting the highest level of woods products industry jobs.

These prescriptions provide for a wide range of multiple use benefits both priced and nonpriced. The flow of these benefits in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices. No harvest in this area is projected in Decades 1 or 2 for any alternative with these designations.

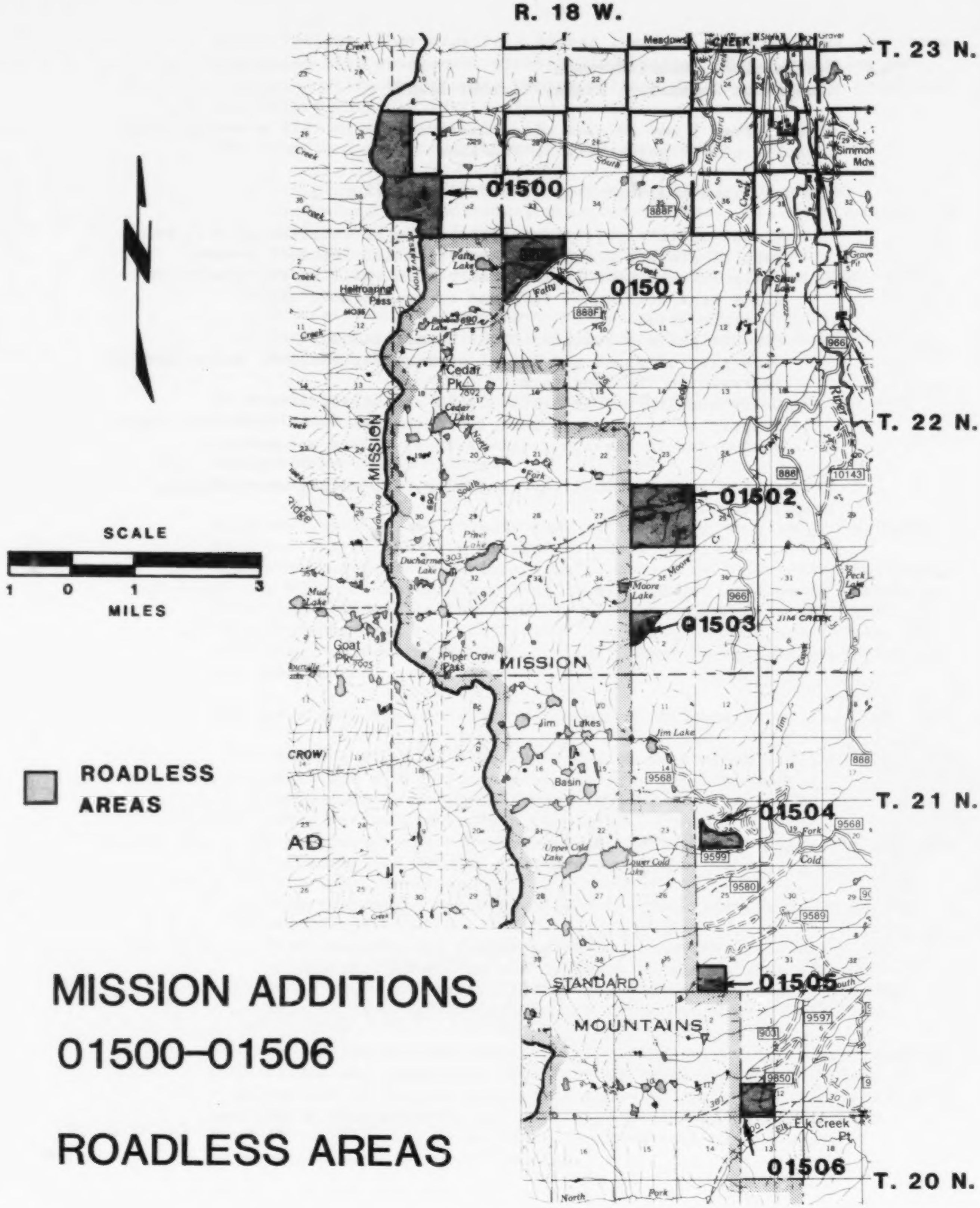
e. **Designation: Nonwilderness**
Management Emphasis: Timber Without Roads

Alternatives 5 and 10 make minor designations to this prescripton as a result of PNV objectives in FORPLAN.

The nonpriced components are affected as follows:

- Visual quality objectives appropriate to local areas will be part of project design with modification the most common.
- Semiprimitive nonmotorized recreation would be provided with wilderness attributes retained or recoverable after implementation.
- Elk and grizzly security would be maintained.
- Diversity of plant and animal communities would be maintained or improved in the long term.
- Water quality and fisheries would not be affected.
- Support of local employment and income would be less than timber roaded due to the lower intensity of timber management.

Oil and gas activity would be limited by the no-surface occupancy stipulations.


R. 18 W.
T. 23 N.
T. 22 N.
T. 21 N.
T. 20 N.
01500
01501
01502
01503
01504
01505
01506
SCALE
1 0 1 3
MILES
ROADLESS AREAS
MISSION
MISSION
STANDARD
MOUNTAINS
Meadows
Creek
Simmons Mdw
Gravel Pit
Shay Lake
Woodward Creek
South
888F
Falls Lake
Hellroaring Pass
Cedar Pk 7692
Cedar Lake
North Fork
South
Piper Lake
Ducharme Lake
Moore Lake
Mud Lake
Goat Pk 7005
Piper Crow Pass
Jim Lakes
Jim Lake
Basin
Jim Creek
Peck Lake
Upper Cold Lake
Lower Cold Lake
Cold
Fork
Elk Creek Pt
North Fork
River
966
888
10143
9568
9599
9580
9589
9597
903
9850
CROW
AD

MISSION ADDITIONS

01500–01506

ROADLESS AREAS

MISSION ADDITIONS 01500 - 01506 (RARE II NOS., 01500 - 01506) - FLATHEAD NATIONAL FOREST

	Total Gross Acres	Total Net Acres
Mission Addition 1 - 01500	960	960
Mission Addition 2 - 01501	360	360
Mission Addition 3 - 01502	640	640
Mission Addition 4 - 01503	40	40
Mission Addition 5 - 01504	150	150
Mission Addition 6 - 01505	80	80
Mission Addition 7 - 01506	110	110

A. DESCRIPTION

These roadless areas are small areas of Federal ownership at 2-3 mile intervals, adjacent to the existing Mission Mountains Wilderness on the west. They qualify for the roadless inventory by virtue of being contiguous to the 73,877 acre Mission Mountain Wilderness. The areas are in a pattern of alternate sections of private ownership and they are usually adjacent to private land on at least one side. Mission Addition No. 1, at the northern tip of the existing Mission Mountains Wilderness, also borders the Kootenai Salish Confederated Tribe's 89,500 acre Mission Mountains Tribal Wilderness.

Access to these sites is by secondary roads leading east from Highway 83.

The areas have fairly steep terrain with a forested appearance. Elevation varies from 5,000 feet to 6,000 feet. Only one of the tracts, Mission Addition No. 7, has a small unnamed lake. Mission Addition No. 3 has very steep slopes rising up from Piper Creek which flows through the center of the site.

The ecosystem is primarily western spruce-fir forest.

Wildlife species in the area include elk, mule deer, black bear, and the grizzly bear, which is classified by the U.S. Fish and Wildlife Service as a threatened species.

Major uses in the areas are hunting and hiking. Mission Additions 3, 5, and 6 contain trails leading into the Mission Mountains Wilderness.

B. CAPABILITY

1. NATURAL INTEGRITY AND APPEARANCE

There is little impact on the sites from developments in the Swan Valley. The areas maintain a natural appearance. There are a few trails, a snow course, and some old logging within the area.

2. OPPORTUNITIES FOR SOLITUDE

There are chances to feel isolated within these areas due to the topography and dense vegetative screening, however, there is a good possibility of intrusion from the surrounding private land.

3. PRIMITIVE RECREATION OPPORTUNITIES

Opportunity for a primitive experience is considered low since the areas lack diversity of terrain, and vastness of scale on those that project into private land.

4. MANAGEABILITY AND BOUNDARIES

These areas have been previously studied as possible additions to the Mission Mountain Wilderness and were excluded on the basis that wilderness boundaries should be located to avoid conflict with public users outside the boundary.* Since the Forest Service has no control over the uses or practices that may occur on contiguous land, these sites are considered vulnerable to visual and noise pollution or excessive access which would degrade a wilderness experience. They would create irregular boundaries making wilderness management difficult.

C. AVAILABILITY

1. RESOURCE POTENTIALS

The discussion that follows refers to significant resources present within this roadless area other than the previously discussed wilderness resource. The chart on the following pages summarizes the existing resource potential for these roadless areas.

Minerals

The areas are within the Montana Overthrust Belt. They are all rated as having high oil and gas potential. There is continuous seismic investigation into the geology of these sites. Hardrock mineral potential is considered to be low in these areas.

Timber

A high percentage of these areas are potentially suitable for timber.

Land Use Authorizations

There are no private inholdings or special uses within these areas.

2. MANAGEMENT CONSIDERATIONS

Some of these areas have been previously studied as possible additions to the Mission Mountain Wilderness and were excluded on the basis that wilderness boundaries should be located to avoid conflict with public uses outside the boundaries. Since the Forest Service has no control over the uses or practices that may occur on contiguous land, these areas are considered vulnerable to visual and noise pollution or excessive access which would degrade a wilderness experience.

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* See "A Proposal - Mission Mountain Wilderness," May 1971, U.S. Department of Agriculture, Flathead National Forest planning records, Kalispell, Montana.

MISSION ADDITION ROADLESS AREA (01500 - 01506)

		Roadless Area Number			
Category	Unit	01500	01501	01502	01503
Gross Acres	Acres	960	360	640	40
Net Acres	Acres	960	360	640	40
Recreation					
Primitive	RVD's	0	0	0	0
Semiprim. Nonmotor.	RVD's	0	0	0	0
Semiprim. Motor.	RVD's	0	0	0	0
Roaded Natural	RVD's	50	75	150	25
Range					
Existing Obligated					
Suitable	Acres	0	0	0	0
AUM's	AUM's	0	0	0	0
Existing Vacant					
Suitable	Acres	0	0	0	0
Allotments	No.	0	0	0	0
AUM's	AUM's	0	0	0	0
Proposed					
Suitable	Acres	0	0	0	0
AUM's	AUM's	0	0	0	0
Timber					
Tentative Suitable	Acres	411	170	590	40
Standing Volume	MBF	5,077	1,190	3,255	604
Corridors					
Exist. & Potential	No.	0	0	0	0
Wildlife - T&E					
Grizzly Bear Habitat					
Situation 1	Acres	960	360	640	40
Situation 2	Acres	0	0	0	0
Situation 3	Acres	0	0	0	0
Gray Wolf Habitat	Acres	0	0	0	0
Wildlife - Big Game					
Summer Habitat	Acres	0	0	0	0
Winter Habitat	Acres	0	0	0	0
Significant Fisheries					
Stream Miles	Miles	0	0	0	0
Stream Habitat	Hab. Ac.	0	0	0	0
Lakes	No.	0	0	0	0
Lake Habitat	Hab. Ac.	0	0	0	0

Category	Unit	01500	01501	01502	01503
Water Developments					
Existing	No.	0	0	0	0
Minerals					
Hardrock Potential					
Very High	Acres	0	0	0	0
High	Acres	0	0	0	0
Moderate	Acres	0	0	0	0
Low	Acres	960	360	640	40
Mining Claims	No.	0	0	0	0
Oil & Gas Potential					
Very High	Acres	0	0	0	0
High	Acres	960	360	640	40
Moderate	Acres	0	0	0	0
Low	Acres	0	0	0	0
Oil & Gas Leases					
Leases	No.	1	1	1	1
Leased Areas	Acres	960	360	640	40

Category	Unit	Roadless Area Number 01504	01505	01506
Gross Acres	Acres	150	80	110
Net Acres	Acres	150	80	110
Recreation				
Primitive	RVD's	0	0	0
Semiprim. Nonmotor.	RVD's	0	0	0
Semiprim. Motor.	RVD's	0	0	0
Roaded Natural	RVD's	50	25	75
Range				
Existing Obligated				
Suitable	Acres	0	0	0
AUM's	AUM's	0	0	0
Existing Vacant				
Suitable	Acres	0	0	0
Allotments	No.	0	0	0
AUM's	AUM's	0	0	0
Proposed				
Suitable	Acres	0	0	0
AUM's	AUM's	0	0	0
Timber				
Tentative Suitable	Acres	150	80	110
Standing Volume	MBF	987	206	1,284
Corridors				
Exist. & Potential	No.	0	0	0
Wildlife - T&E				
Grizzly Bear Habitat				
Situation 1	Acres	150	80	110
Situation 2	Acres	0	0	0
Situation 3	Acres	0	0	0
Gray Wolf Habitat	Acres	0	0	0
Wildlife - Big Game				
Summer Habitat	Acres	0	0	0
Winter Habitat	Acres	0	0	0
Significant Fisheries				
Stream Miles	Miles	0	0	0
Stream Habitat	Hab. Ac.	0	0	0
Lakes	No.	0	0	0
Lake Habitat	Hab. Ac.	0	0	0

Category	Unit	01504	01505	01506
Water Developments				
Existing	No.	0	0	0
Minerals				
Hardrock Potential				
Very High	Acres	0	0	0
High	Acres	0	0	0
Moderate	Acres	0	0	0
Low	Acres	150	80	110
Mining Claims	No.	0	0	0
Oil & Gas Potential				
Very High	Acres	0	0	0
High	Acres	150	80	110
Moderate	Acres	0	0	0
Low	Acres	0	0	0
Oil & Gas Leases				
Leases	No.	1	1	1
Leased Areas	Acres	150	80	110

D. NEED

1. PROXIMITY TO DESIGNATED WILDERNESS AND TO POPULATION CENTERS

Refer to Table C-1, Parts A and B for proximity data. In addition to the National Forest wilderness areas listed in the table, the areas are contiguous to the 89,500 acre Mission Mountains Tribal Wilderness which is contiguous to the 73,877 acre Mission Mountains Wilderness on the Flathead National Forest. The Confederated Salish and Kootenai Tribal Council designated the Tribal Wilderness in 1979. The area is designated by authority of a Tribal Wilderness Ordinance and not by the Federal 1964 Wilderness Act.

Current use is primarily local residents passing through the areas into the Mission Mountains Wilderness.

2. CONTRIBUTION TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM

The vegetative habitat types, plant species, most animal species, and geologic types known to exist in the areas are well represented in existing wilderness areas.

3. PUBLIC INTERESTS

These areas were considered but rejected for wilderness when the existing Mission Mountains Wilderness was classified in 1973.

Past public involvement for the 1979 RARE II study showed that most of those responding favored nonwilderness management for the areas. The final RARE II designation was nonwilderness for all seven inventoried tracts.

The local public involvement effort for the current roadless inventory and evaluation in September 1983 also showed nonwilderness management was favored by the respondents.

The public was given an opportunity to again comment on classification of these roadless areas when the DEIS Supplement was released for public review in November of 1984. Again public support for wilderness designation was low; however, the State of Montana, through the Governor's Office, recommended that Mission Addition No. 01500 be added to the Mission Mountain Wilderness.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENT BY ALTERNATIVE

The estimated acres of management emphasis for the Mission Addition roadless areas are displayed in the following tabulation for all 17 Forest Plan Alternatives. The designations are summarized below for all seven tracts by management emphasis.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

	Alternatives (Acres)							
Management Emphasis*	1	2	3	4	5	6	7	8
Wilderness	0	0	0	0	0	0	0	0
Roadless	647	100	254	0	130	840	680	224
Minimum Level	480	830	660	910	420	110	0	480
Wildlife	0	0	0	0	0	0	0	0
Timber W/Roads	1,213	1,410	1,426	1,430	1,790	1,390	1,660	1,636
Timber W/O Roads	0	0	0	0	0	0	0	0
Total	2,340	2,340	2,340	2,340	2,340	2,340	2,340	2,340

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	1	2	3	4	5	6	7	8
ROADED	1 ---------->	0	360	360	0	0	600	600	360
	5	1,213	1,410	1,426	1,430	1,790	1,390	1,390	1,636
ROADLESS	1 ---------->	2,340	1,980	1,980	2,340	2,340	1,740	1,740	1,980
	5	1,127	930	914	910	550	950	950	704
WILDERNESS	1 ---------->	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

	Alternatives (Acres)								
Management Emphasis*	9	10	11	12	13	14	15	16	17PA
Wilderness	2,340	0	0	0	0	0	0	2,340	0
Roadless	0	130	228	228	228	228	228	0	228
Minimum Level	0	420	480	480	480	480	480	0	480
Wildlife	0	0	0	0	0	0	0	0	0
Timber W/Roads	0	1,790	1,632	1,632	1,632	1,632	1,632	0	1,632
Timber W/O Roads	0	0	0	0	0	0	0	0	0
Total	2,340	2,340	2,340	2,340	2,340	2,340	2,340	2,340	2,340

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	9	10	11	12	13	14	15	16	17PA
ROADED	1 ---------->	0	0	360	360	360	360	360	0	360
	5	0	1,790	1,632	1,632	1,632	1,632	1,632	0	1,632
ROADLESS	1 ---------->	0	2,340	1,980	1,980	1,980	1,980	1,980	0	1,980
	5	0	550	708	708	708	708	708	0	708
WILDERNESS	1 ---------->	2,340	0	0	0	0	0	0	2,340	0
	5	2,340	0	0	0	0	0	0	2,340	0

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

2. IMPACTS

The effects of the various designations are discussed below by management emphasis.

a. Designation: Wilderness
Management Emphasis: Wilderness

As a result of the relatively low level of express public interest in adding these roadless tracts to the Mission Wilderness, the areas are designated as wilderness only in Alternatives 9 and 16, which have high wilderness objectives. No significant differences in value or need for wilderness classification among the seven tracts was identified by public input or analysis.

Wilderness designation will preserve or enhance wilderness attributes. Current uses which may not conform with wilderness management include oil and gas leasing. All of the acres within these roadless areas have been leased. No timber harvest would be permitted.

Current contracts for oil and gas leases would be permitted to run their course with emphasis on contract administration to protect wilderness attributes. Oil and gas exploration and development costs will be increased.

The nonpriced components are affected as follows:

- Visual quality would be preserved.
- National Wilderness Preservation System lands will increase.
- Grizzly bear, elk, and other wildlife species would have increased security.
- Diversity would tend towards climax vegetation. This would depend on what type of fire management programs were implemented.
- Water quality and fisheries quality would be maintained at natural levels.
- Nonpriced spiritual, scientific, and esthetic values would be fully preserved.
- All nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values and would be provided.

b. Designation: Nonwilderness
Management Emphasis: Roadless

The effects of the roadless designation is to maintain the roadless resource by establishing a management objective of keeping the area roadless. Other resources are managed subject to the primary roadless objective. Wilderness attributes may be affected to different degrees depending on the recreation or wildlife habitat objectives of local areas. Modification of natural systems to accommodate multiple-use objectives is most noticeable when trails, campsites, or other recreation facilities are constructed and maintained. Vegetation management practices for wildlife habitat or other purposes may involve prescribed burning. Motorized equipment, such as chainsaws, helicopters, motorbikes, and snowmobiles, are often used to facilitate cost-efficient management or maintenance activities or as part of the recreation opportunities. Although these activities or uses affect wilderness attributes at the time of implementation, they are short-term effects and the wilderness attributes could be easily reclaimed by eliminating the use and allowing vegetation to regrow.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be maintained.
- Grizzly bear and other wildlife security will be maintained.
- Diversity will be maintained at current or higher levels.
- Water quality and fisheries quality would be maintained at natural levels.
- Employment and income from wood products will not be provided.
- Many nonpriced benefits of wilderness such as spiritual values, gene pool, and other scientific values and natural appearance will be provided.

c. **Designation: Nonwilderness**
Management Emphasis: Minimum Level

Minimum management is designated on areas which are not needed to meet objectives of alternatives. The designations range from 4 to 39 percent in alternatives which designate the Mission Additions to nonwilderness. Alternatives 9 and 16 make no designations because the tracts are designated as wilderness.

The effect of this prescription is to "do nothing" except to maintain existing improvements and resources. In alternatives which designate large contiguous areas to this prescription, no developments would occur due to surface resources. For alternatives which designate small areas which are not contiguous, the management direction may provide for roads to cross these areas to support management objectives of the adjacent management units. The geographic configurations of the designations in each alternative in relation to adjacent management units determine the effects minimum management may have on wilderness attributes. These areas are the lands between the suitable timberlands and the ridgetop recreation trails. There are no minimum management designations in roadless areas on the Flathead in any alternative that would affect wilderness attributes.

The nonpriced components are affected as follows:

- Visual quality will be retained.

- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be available but not by management design.
- Grizzly bear and other wildlife species will have security maintained.
- Diversity would tend toward climax species.
- Water quality and fisheries would not be affected by management activities.
- Minimum contribution to employment and income would result as there will be no commodity outputs and only incidental recreation use.
- Many nonpriced wilderness benefits may still be provided by this management prescription since only minimum cost care taking activities, such as fire protection, would affect the land.

d. Designation: Nonwilderness
Management Emphasis: Timber with Roads

Alternatives 1-8, 10-15, and 17 designate from 52 to 77 percent of the total roadless areas to roaded timber management.

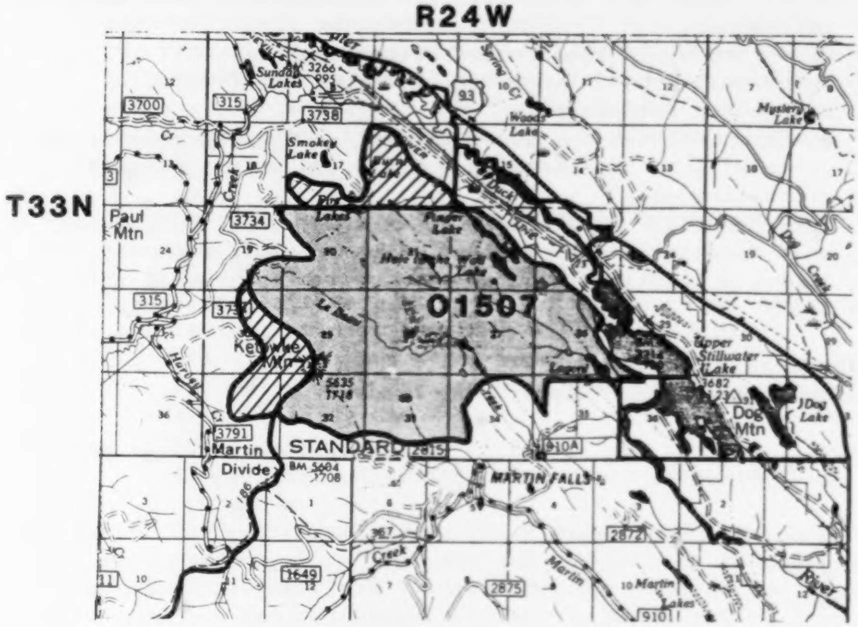
The consequences of these designations are a loss of wilderness attributes at the time of implementation of timber harvest or support activities requiring roads. The roadless resource and wilderness attributes of natural integrity, natural appearance, opportunity for solitude, and primitive recreation are foregone when these management prescriptions are implemented.

The nonpriced components are affected as follows:

- Visual quality will be modification or maximum modification where man's activities will dominate the landscape.
- Semiprimitive nonmotorized and wilderness recreation attributes would be foregone within 50 years.
- Elk security and big-game hunting opportunities would be reduced but mitigated through road-use management depending on site-specific needs.
- Diversity would be improved and nongame wildlife would be maintained.
- Water quality and fisheries would be adversely affected but mitigated through the use of "Best Management Practices".
- Local economic stability would be provided by supporting the highest level of woods products industry jobs.

These prescriptions provide for a wide range of multiple-use benefits both priced and nonpriced. The flow of these benefits in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices.

Implementation of timber harvest in these areas is not projected to begin until Decade 2. All tracts would be accessed by Decade 5.


R24W
T33N
Paul Mtn
Smokey Lake
Mystery Lake
Woods Lake
Finger Lake
01507
Kelvie Mtn
Upper Stillwater Lake
Dog Mtn
Dog Lake
STANDARD
Martin Divide
MARTIN FALLS
Martin Lakes
3700
315
3738
93
3734
3791
910A
2815
2875
1649
9101

LEBEAU 01507

ROADLESS AREA

▒ **ROADLESS AREA FNF**

▨ **ROADLESS AREA KNF**

SCALE
1
0
1
3
MILES

LE BEAU 01507 (RARE II NO. 01507) - FLATHEAD NATIONAL FOREST

Total Gross Acres:	6,210	Total Net Acres	6,210
Flathead National Forest	5,410	Flathead National Forest	5,410
Kootenai National Forest	800	Kootenai National Forest	800

A. DESCRIPTION

The Le Beau roadless area is located at the northern end of the Tally Lake Ranger District with a small area on the Kootenai National Forest in the Ketowki Mountain and Five Lakes area. The Flathead National Forest is the lead Forest for this roadless area.

Access is attained via roads #2870, #2872, #910A, #910, #5310, and #2815. These roads only allow access to the periphery of the area and some are of a primitive condition. No trail systems exist within the area.

The area is characterized by a combination of lower elevation (3,400 feet) undulating wetland with meadows and steep glaciated exposed rock formations up to about 5,600 feet. The upper reaches of Le Beau Creek have steep rock walls and the lower reaches of the creek grade into the gently undulating type terrain. The area contains eight small lakes, some unnamed, ranging in size from 5 to 34 acres.

Generally, the area is thickly tree covered with a variety of seral and climax tree species including western larch, lodgepole pine, ponderosa pine, birch, quaking aspen, and western red cedar. Habitat types identified to date include Douglas-fir and western red cedar series. More western red cedar is present here than elsewhere on the Tally Lake Ranger District, most of it in younger age classes.

The area has outstanding examples of pleistocene glaciation, and rock outcroppings (precambrian sedimentary rocks, sandstones, mudstones, and limestones) are numerous throughout the area.

The eastern one-third of the area contains some habitat types as yet not within a research natural area elsewhere on the Flathead National Forest.

There is evidence that various species, including black bear, moose, elk, deer, and other small game and nongame species, utilize the area.

In addition to the wildlife previously mentioned, there have been cougar sightings near the Le Beau area and cougar tracks observed in Martin Creek which is the south boundary of the area. The area is considered unoccupied grizzly bear habitat, although there have been grizzly bear sightings near Olney which is 4 miles southeast. A bald eagle nest, which has been occupied over a span of several years, is located on the west side of the Stillwater Lake, bordering the Le Beau area on the east.

Use of the Le Beau roadless area includes camping, fishing, hunting, backpacking, and berry picking. Current recreation use is relatively light. This area has remained roadless because of the difficulty and cost of transportation development. There are some foot trails to lakes in this area, but they are very primitive.

B. CAPABILITY

1. NATURAL INTEGRITY AND APPEARANCE

Most of the 6,210 acres have not been affected by man. A small portion of the area was logged in the 1920's. With access only on the periphery of the area, a natural state has prevailed.

The sounds from the highway and railroad on the northeastern border only penetrate partially into the area. The greater portion, is screened from these and other impacts by ridges. Trails in the area are primitive, and the old skid trails are grown over. A few "wheel track" ORV trails exist in the Five Lakes and Lagoni Lake areas.

2. OPPORTUNITIES FOR SOLITUDE

The sights and sounds of two major sources of distraction, the railroad and Highway 93, are only evident on the eastern side. A visitor to the center of this area beyond the ridges would be exploring country unimpacted by man's activities.

3. PRIMITIVE RECREATION OPPORTUNITIES

Primitive experiences are possible in the form of hunting, fishing, camping, and hiking. The lack of a trail system and limited road access add to the primitive experience. Some motorized 4 x 4 and ORV use occurs in the Five Lakes and Lagoni Lake areas.

4. OTHER FEATURES

Past glacial activity, in the form of extensive scouring, is perhaps the area's most unique attraction. There is also a great variety of vegetation among the many rock outcrops within the area.

5. MANAGEABILITY AND BOUNDARIES

The southern and eastern sides of this area are partially defined by natural features. Martin Creek and the Stillwater River provide natural boundaries. The eastern side also has one block of State-owned land and a block of private. The western and northern boundaries are roaded or timber harvest units existing on the Kootenai National Forest.

The RARE II study in 1979 inventoried the roadless area with the northern and western boundary the same as the Forest boundary between the Kootenai and Flathead National Forests. As a result of public comments on the current roadless inventory, the boundary was adjusted resulting in an increase of 800 acres over the RARE II inventory.

C. AVAILABILITY

1. RESOURCE POTENTIALS

The discussion that follows refers to significant resources present within this roadless area other than the previously discussed wilderness resource.

The chart on the following page summarizes the existing resource potential for this roadless area.

Wildlife

Of the seven lakes within the Le Beau area, four of them contain fish. Lagoni Lake, one of the four, was recently rehabilitated and stocked with native cutthroat trout. Fire, Finger, and Wall Lakes contain Eastern Brook Trout.

A portion of the area has been recommended for a RNA (Research Natural Area). Its value for this nomination lies in the fact that the limited access would maintain the natural environment, and it contains some of the habitat types that Region 1 needs to complete a full representation of Northern Rocky Mountain ecosystems.

Timber

Within the area, there is an estimated 21 MMBF of timber or 5,786 acres potentially suitable acres. Analysis indicated that it would not be economical to remove the timber because of abnormally high costs.

Water

Le Beau Creek supplies a high quality water source for the Stillwater drainage.

Land Use Authorizations

There are no inholdings or special uses within the area.

This area is within the Montana Overthrust Belt. The area is rated as having high oil and gas potential. There is continuous seismic investigation in this area. Hardrock mineral potential is considered to be low.

2. MANAGEMENT CONSIDERATIONS

Fire is a part of the history of this area. Lack of any vegetative manipulation, that converts old-growth stands and reduces the fuel loading, will eventually contribute to a greater danger of wildfire.

There are some lodgepole pine stands that are or will be susceptible to epidemic buildup of the mountain pine beetle.

LE BEAU ROADLESS AREA (01507)

Category	Unit	Flathead	Kootenai
Gross Acres	Acres	5,410	800
Net Acres	Acres	5,410	800
Recreation			
Primitive	RVD's	63	0
Semiprim. Nonmotor	RVD's	0	0
Semiprim. Motor	RVD's	12	12
Roaded Natural	RVD's	0	0
Range			
Exisisting Obligated			
Suitable	Acres	0	0
Allotments	No.'s	0	0
AUM's	AUM's	0	0
Existing Vacant			
Suitable	Acres	0	0
Allotments	No.	0	0
AUM's	AUM's	0	0
Proposed			
Suitable	Acres	0	0
AUM's	AUM's	0	0
Timber			
Tentative Suitable	Acres	4,986	800
Standing Volume	MBF	47,114	7,559
Corridors			
Exist. & Potential	No.	1	0
Wildlife - T & E			
Grizzly Bear Habitat			
Situation 1	Acres	0	0
Situation 2	Acres	0	0
Situation 3	Acres	0	0
Gray Wolf			
Habitat	Acres	0	0

Category	Unit	Flathead	Kootenai
Wildlife - Big Game		0	0
Summer Habitat	Acres	0	0
Winter Habitat	Acres	0	0
Significant Fisheries		0	0
Stream Miles	Miles	0	0
Stream Habitat	Hab. Ac.	0	0
Lakes	No.	4	0
Lake Habitat	Hab. Ac.	84	0
Water Developments			
Existing	No.	0	0
Minerals			
Hardrock Potential			
Very High	Acres	0	0
High	Acres	0	0
Moderate	Acres	0	0
Low	Acres	5,410	800
Mining Claims	No.	0	0
Oil & Gas Potential			
Very High	Acres	0	0
High	Acres	5,410	800
Moderate	Acres	0	0
Low	Acres	0	0
Oil & Gas Potential			
Leases	No.	0	2
Leased Area	Acres	0	800

One block of State land consisting of 240 acres is within the area on the east side in the Lagoni Lake area. This land, if necessary, could be obtained through an exchange with the state. Private land just northeast of Finger Lake could remain in private ownership and not affect the integrity of the Le Beau area.

Hunting pressures may force game into the area in search of a sanctuary. Without vegetative manipulation from timber sales, there is a loss of opportunity to improve habitats.

As long as this area remains without a transportation system (roads or trails), use is not anticipated to increase over present estimates.

The area, as inventoried, could form a reasonable wilderness management unit with minor boundary adjustments.

D. NEED

1. PROXIMITY TO DESIGNATED WILDERNESSES AND TO POPULATION CENTERS

Refer to Table C-1, Part A and B for proximity data. In addition to the National Forest wilderness and roadless areas listed in the table, the Le Beau area is located 25 miles west of the 1,000,000 acre Glacier National Park. A large part of Glacier National Park is currently being studied for wilderness classification. Additonal roadless and wilderness areas are available in Canada in the form of Provincial Parks and Forests within 100 miles of Flathead National Forest. The relatively small amount of current recreational use the area receives is attributed to the fact that an abundance of high quality wilderness opportunities exist in the Forest zone of influence along with the fact that the Le Beau area is not well known in population centers. Current use is primarily from local residents.

2. CONTRIBUTION TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM

There are few vegetative habitat types, plant or animal species, or geologic types known to exist in this area that are not currently represented in existing wilderness areas; however, as previously stated, the eastern area contains some habitat types not currently within a Research Natural Area on the Flathead National Forest.

3. PUBLIC INTERESTS

James Habeck, Professor of Plant Ecology, University of Montana, has recommended this area, identified by him as the Lagoni Lake/Radnor site, to be nominated as a RNA.

Past public involvement for the 1979 RARE II study showed that the responses on the Le Beau roadless area favored nonwilderness. The final RARE II designation was nonwilderness.

The roadless inventory and public involvement effort in September 1983 showed that most of the respondents preferred nonwilderness uses. Of all the Flathead National Forest roadless areas, Le Beau had the fewest number of total comments and the lowest level of support for wilderness classification. The respondents indicated a relatively high level of support for nonwilderness roadless management.

The public was given an opportunity to again comment on classification of this roadless area when the DEIS Supplement was released for public review in November of 1984. Again public support for wilderness designation of the area was low. There was some concern that the whole roadless areas should be considered for a Research Natural Area not just the northeast portion as proposed in the Forest Plan.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENT BY ALTERNATIVE

The estimated acres of management emphasis for the Le Beau roadless area are displayed in the following tabulation for all 17 Forest Plan Alternatives. A summary of the designations as they affect the roadless and wilderness resources is displayed below by management emphasis.

2. IMPACTS

a. Designation: Wilderness
Management Emphasis: Wilderness

Wilderness designation will preserve or enhance wilderness attributes. Current uses involving motorized recreation, trail maintenance, wildlife habitat improvement, and other uses or facilities not compatible with wilderness management would be eliminated. No timber harvest would be permitted.

Current contracts for oil and gas leases, special uses, or grazing would probably be permitted to run their course with emphasis on contract administration to protect wilderness attributes. Oil and gas exploration and development costs will be increased. Additional leases in the RARE II inventoried portion of the area would not be issued.

The nonpriced components are affected as follows:

- Visual quality would be preserved.
- National Wilderness Preservation System lands will increase.
- Elk and other wildlife species would have increased security.
- Diversity would tend towards climax vegetation but could be maintained near current levels if successful fire management programs were implemented.
- Water quality and fisheries quality would be maintained at natural levels.
- Local employment and income would decrease due to a reduced timber base and nonwilderness recreational opportunities.

- All nonpriced benefits of wilderness such as spiritual values, gene pool, and other scientific values and natural appearance will be provided.

The economic and social effects would be greatest in Alternative 9 which designates all the roadless area to wilderness. The future capacity of the Forest to produce timber and accommodate recreation use would be reduced more than in other alternatives, and maximum displacement of existing uses would occur.

All alternatives except Alternative 9 make no designations of this area to wilderness.

Designation as wilderness in Alternative 9 would enhance wilderness attributes by eliminating motorized uses and would assure no future disturbances to land or vegetation.

b. **Designation: Nonwilderness**
Management Emphasis: Roadless

The effects of the roadless designation is to maintain the roadless resource by establishing a management objective of keeping the area roadless. Other resources are managed subject to the primary roadless objective. Wilderness attributes may be affected to different degrees depending on the recreation or wildlife habitat objectives of local areas. Modification of natural systems to accommodate multiple-use objectives is most noticeable when trails, campsites, or other recreation facilities are constructed and maintained.

Vegetation management practices for wildlife habitat or other purposes usually involve prescribed burning. Motorized equipment, such as chainsaws, helicopters, motorbikes, and snowmobiles, are often used to facilitate cost-efficient management or maintenance activities or as part of the recreation opportunities. Although these activities or uses affect wilderness attributes at the time of implementation, they are short-term effects and the wilderness attributes could be easily reclaimed by eliminating the use and allowing vegetation to regrow.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be maintained.
- Elk and other wildlife security will be high but less than that provided by wilderness management.
- Diversity will be maintained at current or higher levels.
- Water quality and fisheries will be maintained or improved.
- Employment and income from wood products will not be provided.
- Many nonpriced benefits of wilderness such as spiritual values, gene pool, and other scientific values and natural appearance will be provided.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

Management Emphasis*	Alternatives (Acres) 1/ 1	2	3	4	5	6	7	8
Wilderness	0	0	0	0	0	0	0	0
Roadless	5,350	319	5,310	410	5,410	0	4,220 (500)	5,330
Minimum Level	0	80	0	3,260	0	380	0	0
Wildlife	0	0	0	0	0	0	0	0
Timber W/Roads	860 (800)	2,777 (800)	900 (800)	2,220 (800)	800 (800)	2,660 (800)	1,990 (300)	880 (800)
Timber W/O Roads	0	3,034	0	320	0	3,170	0	0
Total	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)

Summary of Management Emphases (Both Flathead and Kootenai National Forest Acres)
(Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	1	2	3	4	5	6	7	8
ROADED	1 -------->	0	200	0	200	0	200	200	200
	5	860	2,777	900	2,220	800	2,660	1,990	880
ROADLESS	1 -------->	6,210	6,010	6,210	6,010	6,210	6,010	6,010	6,010
	5	5,350	3,433	5,310	3,990	5,410	3,550	4,220	5,330
WILDERNESS	1 -------->	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

1/ Includes the Kootenai National Forest acres managed under an alternative similar to the Flathead National Forest Alternative. Acres in ( ) are Kootenai National Forest portion.

The following chart displays the comparison between Flathead National Forest and Kootenai National Forest alternatives.

Flathead National Forest Alternative(s)	Kootenai National Forest Alternative(s)
1	A
2	A
3	A
4	A
5	A
6	M
7 CD	J
8	A
9	H
10	G
11	J
12	A
13	A
14	G
15	H
16	H
17PA	J

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* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

Management Emphasis*	Alternatives (Acres) 1/ 9	10	11	12	13	14	15	16	17PA
Wilderness	6,210 (800)	0	0	0	0	0	0	0	0
Roadless	0	5,410	5,830 (500)	5,330	5,330	5,330	6,130 (800)	6,150 (800)	5,830 (500)
Minimum Level	0	0	0	0	0	0	0	0	0
Wildlife	0	0	0	0	0	0	0	0	0
Timber W/Roads	0	800 (800)	380 (300)	880 (800)	880 (800)	880 (800)	80	60	380 (300)
Timber W/O Roads	0	0	0	0	0	0	0	0	0
Total	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)	6,210 (800)

Summary of Management Emphases (Both Flathead and Kootenai National Forest Acres)
(Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade									
ROADED	1 --------->	0	0	0	200	200	200	0	0	0
	5	0	800	380	880	880	880	80	60	380
ROADLESS	1 --------->	0	6,210	6,210	6,010	6,010	6,010	6,210	6,210	6,210
	5	0	5,410	5,830	5,330	5,330	5,330	6,130	6,150	5,830
WILDERNESS	1 --------->	6,210	0	0	0	0	0	0	0	0
	5	6,210	0	0	0	0	0	0	0	0

1/ Includes the Kootenai National Forest acres managed under an alternative similar to the Flathead National Forest Alternative. Acres in ( ) are Kootenai National Forest portion.

The following chart displays the comparison between Flathead National Forest and Kootenai National Forest alternatives.

Flathead National Forest Alternative(s)	Kootenai National Forest Alternative(s)
1	A
2	A
3	A
4	A
5	A
6	M
7 CD	I
8	A
9	H
10	G
11	J
12	A
13	A
14	G
15	H
16	H
17PA	J

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

Alternatives 9 and 16 designate no acres to these prescriptions. Other alternatives desiginate from 15 to 87 percent of the total 6,210 acres to roadless management.

The revised Preferred Alternative (Alternative 17) designates all the Flathead portion to roadless management. This alternative protects the significant roadless resources of the area, establishes practical management boundaries, and minimizes adverse social and economic impacts. The Preferred Alternative also retains the recommendation for a Research Natural Area within the roadless designation on the Flathead National Forest.

The roadless resource could be impacted by exploration and development of mineral resources. This resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. The Bureau of Land Management is the final authority for Federal mineral management. The probability of roading and development in this area is remote. If such development is proposed and implemented, it would be integrated into surface resource management to the extent that is reasonable. The most probable mineral development in this area is oil and gas. Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling. The probability of occurrence sharply diminishes with each step.

Although these activities would be mitigated to be consistent with roadless management objectives, some of the nonpriced components would be affected in the field development stage as follows:

- Existing visual conditions may be temporarily lowered.
- Introduction of roads and exploration activities adversely affect the quality of the recreation setting.
- Wildlife security would be reduced and temporary displacement from normal seasonal ranges may occur.
- Employment and income from the oil and gas resources would be provided.

c. **Designation: Nonwilderness**
Management Emphasis: Minimum Level

The effect of this prescription is to "do nothing" except to maintain existing improvements and resources. In alternatives which designate large contiguous areas to this prescription, no developments would occur due to surface resources. For alternatives which designate small areas which are not contiguous, the management direction may provide for roads to cross these areas to support management objectives of adjacent management units. The geographic configurations of the designations in each alternative in relation to adjacent management units determine the effects minimum management may have on wilderness attributes. All alternatives, except Alternative 4, designate only small isolated areas which are not needed to be managed in order to achieve the objectives of each alternative. Alternative 4 designates substantial roadless areas to this prescription to minimize costs and maximize revenues. These areas are the lands between the suitable timberlands and the ridge top recreation trails.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be available but not by management design.
- Elk and other wildlife species will have security maintained but not assured, due to an absence of management objectives for the area.
- Diversity would tend toward climax species.
- Water quality and fisheries would not be affected by management activities.
- Minimum contribution to employment and income would result as there will be no commodity outputs and only incidental recreation use.
- Many nonpriced wilderness benefits may still be provided by this management prescription since only minimum cost care taking activities, such as fire protection, would affect the land.

d. **Designation: Nonwilderness**
Management Emphasis: Timber With Roads

Alternatives 1, 2, 3, 4, 6, and 7 designate some portions of the area to timber management emphasis prescriptions. The consequences of these designations is a loss of wilderness attributes at the time of implementation of timber harvest or support activities requiring roads. The roadless resource and wilderness attributes of natural integrity, natural appearance, opportunity for solitude, and primitive recreation are foregone when these management prescriptions are implemented.

The nonpriced components are affected as follows:

- Visual quality will be modification or maximum modification where man's activities will dominate the landscape.
- Semiprimitive nonmotorized and wilderness recreation attributes would be foregone within 50 years.
- Elk security and big-game hunting opportunities would be reduced but mitigated through road-use management depending on site-specific needs.
- Diversity would be improved and nongame wildlife would be maintained.
- Water quality and fisheries would be adversely affected but mitigated through the use of "Best Management Practices".
- Local economic stability would be provided by supporting the highest level of woods products industry jobs.

These prescriptions provide for a wide range of multiple-use benefits both priced and nonpriced. The flow of these benefits in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices.

Alternatives 2, 6, and 7 would be the only alternatives that project substantial Decade 1 timber harvest which would leave less than 5,000 contiguous acres for a roadless resource in the Le Beau roadless area.

All other alternatives, except Alternative 9 which designates no timber management, designate timber management primarily on the Kootenai portion. Implementation of some timber harvest in the Ketowke Mountain area, on the Kootenai portion, is projected in Decade 1. Implmentation in the Five Lakes area on the Kootenai is not projected until Decade 2 or later. No designations to timber harvest are made in the Preferred Alternative for the Flathead portion of the area.

e. **Designation: Nonwilderness**
Management Emphasis: Timber Without Roads

Only Alternatives 2, 4, and 6 have areas designated as these management prescriptions. Those designations are areas with commercial timber where road construction is very expensive. Logging would employ aerial yarding systems, and no roads would be constructed. Implementing would impact the vegetation and would not reach long distances into roadless areas. Since the land itself would not be changed, wilderness attributes could be easily reclaimed after implementation by vegetative regrowth. Implementation would proceed slowly for all alternatives designating these prescriptions. Only a few hundred acres would be affected in Decade 5 when economic efficiency of the prescription is projected to be best. The prescription would not make significant economic or social effect changes until Decade 4, when implementation is projected to increase. The first decade timber harvest scheduled under this prescription could be relocated to other areas without affected objectives or outputs of the alternative.

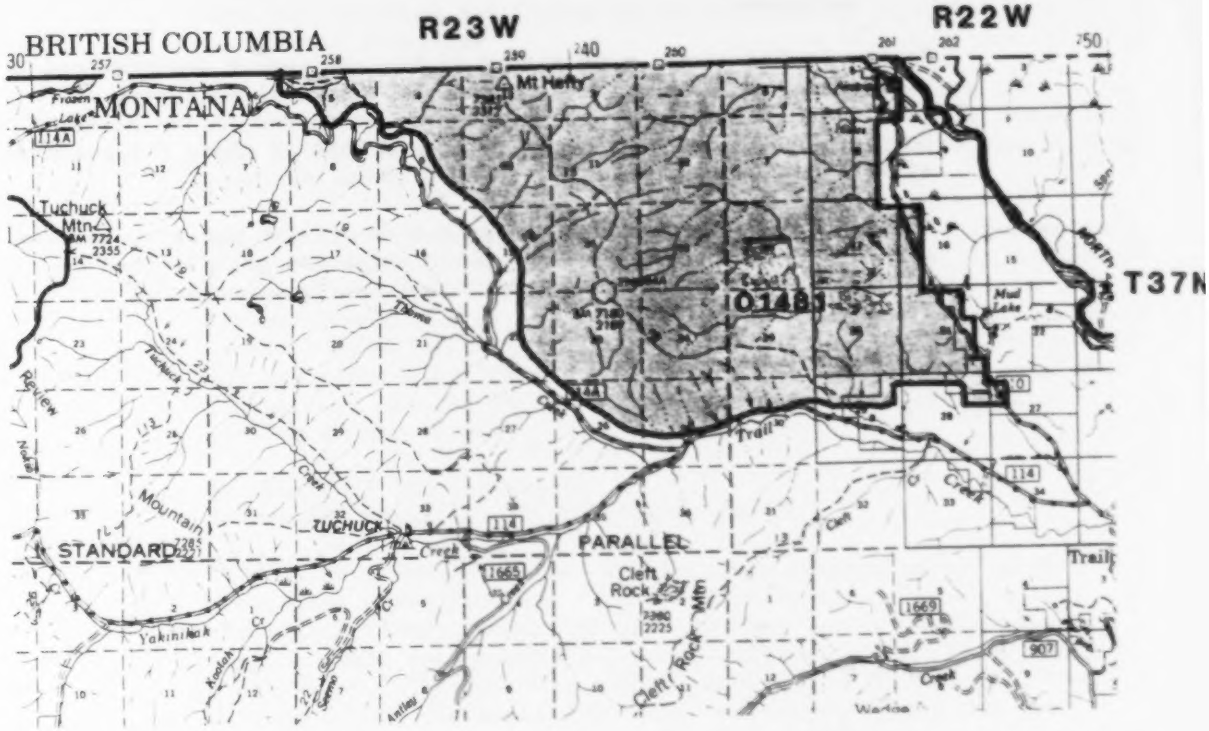
The nonpriced benefits are as follows:

- Visual quality objectives appropriate to local areas will be part of project design with modification the most common.
- Semiprimitive nonmotorized recreation would be provided with wilderness attributes retained or recoverable after implementation.
- Elk and grizzly security would be maintained.
- Diversity of plant and animal communities would be maintained or improved in the long term.

- Water quality and fisheries would not be affected.
- Support of local employment and income would be less than timber roaded due to the lower intensity of timber management.

In the Le Beau area, some roaded timber management designations are necessary to make the economics of the roadless system feasible. The area managed with roads is needed in the Flathead portion to support these designations. None of these designations affect the Kootenai portion of the area.

Oil and gas activity would be limited to seismic surveys, because all slopes in this management prescription are greater than 60 percent. All areas leased contain a no-surface occupancy stipulation.


R23W
R22W
BRITISH COLUMBIA
MONTANA
Mt Hefty
Tuchuck Mtn
7724
2355
T37N
01481
Frozen Lake
114A
114
1665
1669
907
STANDARD
TUCHUCK
PARALLEL
Cleft Rock
Cleft Rock Mtn
Review
Mountain
Tuchuck
Creek
Trail
Yakinikak
Kootok
Mud Lake

MT. HEFTY

01481

ROADLESS AREA

▨ **ROADLESS AREA**

SCALE

1 0 1 2

MILES

MT. HEFTY 01481 (RARE II No. 01481) - FLATHEAD NATIONAL FOREST

Total Gross Acres: 13,720 Total Net Acres: 13,720

A. DESCRIPTION

Mt. Hefty roadless area is located in the north end of the Flathead National Forest, just south of the Canadian border. It is one of seven roadless areas located in what is often referred to as the "North Fork." The boundaries are formed by British Columbia, Canada on the north; the Frozen Lake Road on the west; the Flathead River to the east; and the Trail Creek Road on the south. The area is accessed by the North Fork Road from Columbia Falls and the Frozen Lake Road from the west.

Topography consists of typical steep alpine glaciated canyons and gently rolling ground morraines. Elevation varies from 4,200 feet to 7,585 feet, with Mt. Hefty being the highest peak within the unit. The major drainage is Ketchikan Creek, however the western portion drains into Thoma Creek.

Much of this area burned in the 1910, 1917, and 1929 fires. The predominant tree species in the burned over area is lodgepole pine and western larch. The remainder of the area is a mixture of alpine fir, Douglas-fir, and spruce with the exception of the area over 6,000 feet in elevation which is almost exclusively whitebark pine and subalpine fir.

This area includes some of the finest grizzly bear habitat in the United States. It contains all the necessary grizzly bear habitat components* as well as key population centers. Sightings of the gray wolf, an endangered species, increased during 1983. It is believed that wolves from Canada are becoming established in this area. Biologists believe the North Fork of the Flathead River drainage is the most likely location in the Rocky Mountains for reestablishing a viable gray wolf population.

Other wildlife species present include mule deer, black bear, whitetailed deer, wolverine, the hoary marmot, golden eagle, and the lynx. There is a possibility of occasional use of this area by mountain caribou ranging down from Canada. Efforts are being made to confirm the existence and extent of caribou use through special surveys and observations by work crews and cooperators.

Scenic attractiveness of the area is very good due to the variety of landscapes within the area and the outstanding views into Glacier Park from Thoma Ridge. There are also at least four known caves within this roadless area. Mt. Hefty roadless area is extremely remote with limited access which has resulted in light use by recreationists. Present use consists primarily of fall big-game hunting with lessor amounts of day-use trips by hikers and horse users.

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* Refer to "The Influence of Logging and Wildfire on Grizzly Bear Habitat in Northwestern Montana," by Peter Edward Zager, 1980.

B. CAPABILITY

1. NATURAL INTEGRITY AND APPEARANCE

There are few onsite impacts that would affect the natural integrity of this area. Those impacts present include approximately 8 miles of low standard trail and the unmanned Thoma Ridge Lookout. The Thoma Ridge Lookout is a cabin style lookout of interest for historical reasons, and does not significantly detract from the natural qualities of the roadless area. Therefore, the general appearance of this area has been influenced by natural processes with very little impact by man.

2. OPPORTUNITIES FOR SOLITUDE

Many offsite impacts can be seen from Thoma Ridge, including extensive logging activities in Canada and on private lands within the North Fork Valley. There is a possibility that the proposed Cabin Creek Coal mine, located in Canada would be visible from Thoma Ridge and Mt. Hefty. The 8 miles of trail provide an opportunity for solitude; however, topographic and vegetative screening of the off-site impacts is generally considered to be poor. The area is, however, far from any local geographic centers, so there would be few meetings of other people in the area.

3. PRIMITIVE RECREATION OPPORTUNITIES

The Mt. Hefty area is considered to have a low potential for primitive recreation use because it is only 4 to 5 miles across and has ineffective topographic and vegetative screening.

4. OTHER FEATURES

The land adjacent to Canada is significant as a grizzly bear and gray wolf travel corridor.

5. MANAGEABILITY AND BOUNDARIES

This area generally contains well-defined boundaries set along topographic features or along roads. Only 20 acres have been added to the Mt. Hefty RARE II inventory and this was a result of acreage recalculation.

MT. HEFTY ROADLESS AREA (01481)

Category	Unit	
Gross Acres	Acres	13,720
Net Acres	Acres	13,720
Recreation		
Primitive	RVD's	0
Semiprim. Nonmotor	RVD's	246
Semiprim. Motor.	RVD's	0
Roaded Natural	RVD's	54
Range		
Existing Obligated		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Existing Vacant		
Suitable	Acres	0
Allotments	No.	0
AUM's	AUM's	0
Proposed		
Suitable	Acres	0
AUM's	AUM's	
Timber		
Tentative Suitable	Acres	8,564
Standing Volume	MBF	30,676
Corridors		
Exist. & Potential	No.	0
Wildlife - T&E		
Grizzly Bear Habitat		
Situation 1	Acres	13,720
Situation 2	Acres	0
Situation 3	Acres	0
Gray Wolf		
Habitat	Acres	13,720

Category	Unit	
Wildlife - Big Game		
Summer Habitat	Acres	0
Winter Habitat	Acres	0
Significant Fisheries		
Stream Miles	Miles	3
Stream Habitat	Hab. Ac.	1
Lakes	No.	0
Lake Habitat	Hab. Ac.	0
Water Developments		
Existing	No.	0
Minerals		
Hardrock Potential		
Very High	Acres	0
High	Acres	0
Moderate	Acres	0
Low	Acres	13,720
Mining Claims	No.	0
Oil & Gas Potential		
Very High	Acres	0
High	Acres	13,720
Moderate	Acres	0
Low	Acres	0
Oil & Gas Leases		
Leases	No.	0
Leased Area	Acres	0

C. AVAILABILITY

1. RESOURCE POTENTIALS

The discussion that follows refers to resources present within this roadless area other than the previously discussed wilderness resource. The chart on the previous page summarizes the existing resource potential for this roadless area.

Wildlife

This area contains some of the best grizzly bear habitat in the lower 48 states and is considered very important for the recovery of the grizzly bear to a level that would allow this species to be removed from the threatened and endangered list. Recent destruction of many of the pine nut producing whitebark pine trees by the mountain pine beetle and regrowth of timber in the 1910, 1917, and 1929 burn areas is viewed as potentially adverse to future grizzly bear production. Sustained production of essential grizzly bear habitat components is needed for the area to assure recovery of the grizzly bear from the threatened status.

This area is also considered important for the recovery of the endangered gray wolf.

Some of the drainages provide spawning habitat for bull trout.

Minerals

The Mt. Hefty roadless area is within the Montana Overthrust Belt, and there is continuous seismic investigation in this area. The area is rated as having high oil and gas potential, while the hardrock mineral potential is considered to be low.

Timber

Whitebark pine and alpine larch are long-lived species and are major stand components above 6,000 feet in elevation. In 1978 the lodgepole pine and whitebark pine in the Mt. Hefty roadless area began experiencing an epidemic infestation of mountain pine beetle. Between 1978 and 1982 this insect had spread throughout the lodgepole pine and whitebark pine stands. Lodgepole pine mortality has been extensive with heavy losses in overmature, and immature stands. Mortality approaching 100 percent was common in stands east of Thoma-Mt. Hefty Ridge. This mortality results in a build up of ground fuel and greatly increases the risk of large wildfires.

There are approximately 8,500 acres of potentially suitable timberlands included in the area.

Recreation

Recreation uses include hunting, some use from snowmobiling, cross-country skiing, hiking, and horseback use. The relatively small amount of current recreational use the area receives is attributed to the fact that an abundance of high quality wilderness opportunities exist in the Forest zone of influence along with the fact that the Mt. Hefty area is not well known in population centers. Current use is primarily from local residents.

Land Use Authorizations

Mt. Hefty roadless area is bounded on the east by private land situated along the North Fork Road. There are no interior private land holdings. This area is adjacent to Canada where there is an ongoing timber salvage operation as a result of an epidemic infestation of mountain pine beetle.

2. MANAGEMENT CONSIDERATIONS

The area as inventoried presents a moderate probability for successful wilderness management, because moderate risks would be involved in containing the natural forces of fire or insect and disease outbreaks within the area. Probability of successful management would be increased if the area were merged with the Tuchuck and Thompson Seton area to the south to form a more manageable wilderness unit.

The area offers outstanding grizzly research opportunities. High costs and low probability of success is anticipated for future grizzly habitat management needs if use of mechanized equipment for prescribed burning or other vegetative treatment is foregone under wilderness management.

D. NEED

1. PROXIMITY TO DESIGNATED WILDERNESSES AND TO POPULATION CENTERS

Refer to Table C-1, Part A and B for proximity data. In addition to the National Forest wilderness and roadless areas listed in the table, the center of the Mt. Hefty area is located just a few miles west of the 1,000,000 acre Glacier National Park. A large part of Glacier National Park is currently being studied for wilderness classification. Additional roadless and wilderness areas are available in Canada's Provincial Parks and Forests within 100 miles of Flathead National Forest.

2. CONTRIBUTION TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM

The vegetative habitat types, plant species, most animal species, and the geologic types known to exist in this area are well represented in existing wilderness areas. The area has National significance due to its potential contribution to grizzly bear/gray wolf recovery.

3. PUBLIC INTERESTS

Past public involvement for the 1979 RARE II study showed that half of those responding supported wilderness management. The final RARE II designation was nonwilderness.

Intensity of public opinion conflict in this area has been increased since the RARE II process due to the continued emergence of the national issues such as potential oil and gas resources and grizzly bear habitat.

The September 1983 public involvement on the current roadless inventory on the Mt. Hefty area, showed that more than half of those responding favored nonwilderness management. The three "North End" roadless areas, Thompson Seton, Tuchuck, and Mt. Hefty received similar support. The expressed demand for timber harvest in the "North End" roadless areas is second highest among all Flathead roadless areas.

The public was given an opportunity to again comment on classification of this roadless area when the DEIS Supplement was released for public review in November of 1984.

There followed a great deal of public concern for the combined Mt. Hefty, Tuchuck, and Thompson Seton (includes Young-Nasukoin) roadless areas. This concern centered on protection of the grizzly bear and gray wolf. Most commenters felt that wilderness designation of these areas would provide the greatest amount of protection for these species.

Timber and oil and gas interests have strong feelings that properly controlled industrial activities can be conducted in the area without adverse effects on the bear and if properly planned, long-term benefits to bear habitat productivity could be provided.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENT BY ALTERNATIVE

The estimated acres of management emphasis for the Mt. Hefty roadless area are displayed in the following tabulation for all 17 Forest Plan Alternatives. The roadless area would be managed differently in the various alternatives in order to contribute appropriately to meeting Forest objectives in each case. The designations are summarized below by management emphasis.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

	Alternatives (Acres)							
Management Emphasis*	1	2	3	4	5	6	7	8
Wilderness	0	0	0	0	0	0	0	0
Roadless	0	4,574	55	1,541	13,720	4,300	0	0
Minimum Level	0	45	0	3,575	0	0	0	0
Wildlife	13,720	10	6,541	0	0	0	0	13,720
Timber W/Roads	0	8,948	7,124	8,604	0	9,420	13,720	0
Timber W/O Roads	0	143	0	0	0	0	0	0
Total	13,720	13,720	13,720	13,720	13,720	13,720	13,720	13,720

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	1	2	3	4	5	6	7	8
ROADED	1 ---------->	0	3,250	0	220	0	4,290	3,760	125
	5	2,578	9,146	5,156	8,604	0	9,420	9,420	2,578
ROADLESS	1 ---------->	13,720	10,470	13,720	13,500	13,720	9,430	9,960	13,595
	5	11,142	4,574	8,564	5,116	13,720	4,300	4,300	11,142
WILDERNESS	1 ---------->	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

	Alternatives (Acres)								
Management Emphasis*	9	10	11	12	13	14	15	16	17PA
Wilderness	13,720	13,720	0	0	0	13,720	13,720	13,720	0
Roadless	0	0	0	0	0	0	0	0	0
Minimum Level	0	0	0	0	0	0	0	0	0
Wildlife	0	0	13,720	13,720	13,720	0	0	0	13,720
Timber W/Roads	0	0	0	0	0	0	0	0	0
Timber W/O Roads	0	0	0	0	0	0	0	0	0
Total	13,720	13,720	13,720	13,720	13,720	13,720	13,720	13,720	13,720

Summary of Management Emphases (Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	9	10	11	12	13	14	15	16	17PA
ROADED	1 ---------->	0	0	0	0	0	0	0	0	0
	5	0	0	1,934	1,934	1,934	0	0	0	0
ROADLESS	1 ---------->	0	0	13,720	13,720	13,720	0	0	0	13,720
	5	0	0	11,786	11,786	11,786	0	0	0	13,720
WILDERNESS	1 ---------->	13,720	13,720	0	0	0	13,720	13,720	13,720	0
	5	13,720	13,720	0	0	0	13,720	13,720	13,720	0

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

2. IMPACTS

a. Designation: Wilderness
Management Emphasis: Wilderness

The entire Mt. Hefty roadless area is designated as wilderness under Alternatives 9, 10, 14, 15, and 16.

Wilderness designation will preserve or enhance wilderness attributes. Current uses involving motorized recreation, trail maintenance, wildlife habitat improvement, and other uses or facilities not compatible with wilderness management would be eliminated. No timber harvest would be permitted, and 8,564 acres available for timber production would be foregone.

Wilderness designation would offer not only protection for the wilderness attributes of the area but would also provide additional security for grizzly bear.

Highlighting of the area on National maps could result in more recreational pressure. Also, the option for treating vegetation for grizzly habitat component objectives through the use of natural or planned ignitions in a wilderness environment while protecting adjacent nonwilderness resources would be expensive.

Current contracts for oil and gas leases, special uses, or grazing would probably be permitted to run their course with emphasis on contract administration to protect wilderness attributes. Oil and gas exploration and development costs would be increased. Exploration activities in the nonleased portion of the area would be prohibited.

The nonpriced components are affected as follows:

- Visual quality would be preserved.
- National Wilderness Preservation System lands will increase.
- Grizzly bear, elk, and other wildlife species would have increased security.
- Diversity would tend towards climax vegetation but could be maintained near current levels if successful fire management programs were implemented.
- Water quality and fisheries quality would be maintained at natural levels.
- Local employment and income would decrease due to a reduced timber base and nonwilderness recreational opportunities.
- Nonpriced spiritual, scientific, and esthetic values would be fully preserved.
- All nonpriced benefits of wilderness such as spiritual values, gene pool, and other scientific values and natural appearance will be provided.

The potential economic benefits of wilderness classification for this area are judged to be small due to the abundance of high quality wilderness on the Forest along with the low recreational carrying capacity of the area especially in light of grizzly bear habitat needs.

b. **Designation: Nonwilderness**
Management Emphasis: Roadless

Alternatives 2-6 designate from less than 1 percent of the roadless area in Alternative 3, to 100 percent in Alternative 5 to roadless management. There are no roadless designations made in Alternatives 9, 10, 14, 15, and 16 because the total area is designated as wilderness. Under Alternatives 11, 12, 13, and 17 most of this roadless area would be managed as part of the Trail Creek Grizzly Bear Management Area (Refer to Chapter II, Page II- __ Alternative 17, Preferred Alternative, Resource Objectives).

The effects of the roadless designation is to maintain the roadless resource by establishing a management objective of keeping the area roadless. Other resources are managed subject to the primary roadless objective. Wilderness attributes may be affected to different degrees depending on the recreation or wildlife habitat objectives of local areas. Modification of natural systems to accommodate multiple-use objectives is most noticeable when trails, campsites, or other recreation facilities are constructed and maintained.

Vegetation management practices for wildlife habitat or other purposes may involve prescribed burning. Motorized equipment such as chainsaws, helicopters, motorbikes, and snowmobiles are often used to facilitate cost-efficient management or maintenance activities or as part of the recreation opportunities. Although these activities or uses affect wilderness attributes at the time of implementation, they are short-term effects and the wilderness attributes could be easily reclaimed by eliminating the use and allowing vegetation to regrow.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be maintained.
- Grizzly bear and other wildlife security will be high but less than that provided by wilderness management.
- Diversity will be maintained at current or higher levels.
- Water quality and fisheries will be maintained or improved.
- Employment and income from woods products will not be provided.
- Many nonpriced benefits of wilderness such as spiritual values, gene pool, and other scientific values and natural appearance will be provided.

The roadless resource could be impacted by exploration and development of mineral resources. This resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. The Bureau of Land Management is the final authority for Federal mineral management. The probability of roading and development in this area is remote. If such development is proposed and implemented, it would be integrated into surface resource management to the extent that is reasonable. The most probable mineral development in this area is oil and gas. Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling. The probability of occurrence sharply diminishes with each step.

Although these activities would be mitigated to be consistent with roadless management objectives, some of the nonpriced components would be affected in the field development stage as follows:

- Existing visual conditions may be temporarily lowered.
- Introduction of roads and exploration activities adversely affect the quality of the recreation setting.
- Wildlife security would be reduced and temporary displacement from normal seasonal ranges may occur.
- Employment and income from the oil and gas resources would be provided.

b. Designation: Nonwilderness
Management Emphasis: Minimum Level

Minimum management is designated on areas which are not needed to meet objectives of alternatives. Alternatives 2 and 4 designate from less than 1 percent to 26 percent of the area to minimum management.

The effect of this prescription is to "do nothing" except to maintain existing improvements and resources. In Alternative 4 which designates a large contiguous area to this prescription, no developments would occur due to surface resources. Alternative 2 designates small areas which are not contiguous. The management direction may provide for roads to cross these areas to support management objectives of adjacent management units. The geographic configurations of the designations in each alternative, in relation to adjacent management units, determine the effects minimum management may have on wilderness attributes. The small isolated areas designated as minimum management are not needed to be managed in order to achieve the objectives of each alternative. Alternative 4 designates substantial roadless areas to this prescription to minimize costs and maximize revenues. These areas are the lands between the suitable timberlands and the ridgetop recreation trails. There are no minimum management designations that would affect significant wilderness attributes in the Mt. Hefty area.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be available but not by management design.
- Grizzly bear and other wildlife species will have security maintained.
- Diversity would tend toward climax species.
- Water quality and fisheries would not be affected by management activities.
- Minimum contribution to employment and income would result as there will be no commodity outputs and only incidental recreation use.
- Many nonpriced wilderness benefits may still be provided by this management prescription since only minimum cost care taking activities, such as fire protection, would affect the land.

d. **Designation: Nonwilderness**
Management Emphasis: Wildlife

This management emphasis includes those areas designated as grizzly bear management and riparian/wildlife. Alternatives 4-7, 9, 10, 14, 15, and 16 do not designate any acreage under these management prescriptions. The remaining 7 alternatives designate from less than 1 percent in Alternative 2 to 100 percent in Alternatives 1, 8, 11, 12, 13, and 17. Under this management emphasis, commodity outputs and recreational use of the land is subordinate to managing the natural ecosystems for wildlife habitat. Development and manipulation of vegetation may be required to achieve the habitat objectives. If such treatments involve commercial timber stands, timber harvest volume may be a byproduct of achieving or maintaining habitat objectives. The timber harvest is scheduled if the project treatments of local habitats involve enough commercial timber stands that regular periodic harvest volume can be predicted.

These prescriptions affect wilderness attributes differently than those where timber management and economics require development and a relatively high level of human activities. Due to wildlife security and cover requirements, these prescriptions require a high degree of constraint on human activities. The result is some reduction in wilderness attributes, compared to wilderness and roadless management amenities, but less than management prescriptions with timber harvest and roading as firm objectives.

The nonpriced components are affected as follows:

- Visual quality will be appropriate to the local area as determined for individual management areas. The most common will provide modification.
- A high level of semiprimitive recreation is provided.
- Grizzly bear and other wildlife species will have a high level of security.

- Diversity and nongame species habitat would be provided.
- Water quality and fisheries habitat will be maintained or improved.
- The prescriptions will provide some support of woods products jobs and a high level of support to recreation industry employment and income due to the role of wildlife in providing a recreation resource base.

Alternatives that designate 100 percent of the roadless area to wildlife management, would maximize protection and management for grizzly bear habitat over the entire area. This management would permit activities which would maintain or improve grizzly bear habitat over the long term based on complete habitat component mapping and analysis. No development would occur in the higher elevation alpine ridges and basins thus, the roadless resource would be preserved for approximately 75 percent of the area. Due to the grizzly bear habitat emphasis, recreational use in areas such as the Chain Lakes area would not be encouraged. Future recreational use will be limited if conflicts with bear management are identified. Development in the suitable timberland area would proceed very slowly under grizzly bear emphasis. Projections estimate timber would be harvested very slowly and rotations would be 180 years or more. This management is anticipated to offset a likely decline in future bear habitat productivity due to natural processes of timber regrowth and declining huckleberry production on old burn areas and mountain pine beetle mortality in mature pine nut producing whitebark pine stands. The appearance of the area at high elevations would continue to appear natural even though vegetative patterns may be considerably influenced by man. Where bear habitat needs require conversion of merchantable timber stands, modification of the land through conventional roading and logging is anticipated. Opportunities for solitude would likely remain very good under grizzly management due to the year-long road closures when they are not being used for habitat management purposes and the low level of activities.

Under the Preferred Alternative (Alternative 17) and also under Alternatives 12 and 13, the Flathead National Forest proposes to manage a portion of the Glacier View Ranger District as the Trail Creek Grizzly Bear Management Area. This would include most of the Mt. Hefty roadless area, and would provide an opportunity for research while providing a high level of security for not only the grizzly bear, but other wildlife species as well.

Oil and gas activity may occur even though it is not designated. Effects from this activity would be the same as discussed under the Roadless Management Prescription.

e. **Designation: Nonwilderness**
Management Emphasis: Timber with Roads

Alternatives 2-4, 6, and 7, designate from 52 to 100 percent of the total roadless area to roaded timber management. The consequences of these designations is a loss of wilderness attributes at the time of implementation of timber harvest or support activities requiring roads. The roadless resource and wilderness attributes of natural integrity, natural appearance, opportunity for solitude, and primitive recreation are foregone when these management prescriptions are implemented.

The nonpriced components are affected as follows:

- Visual quality will be modification or maximum modification where man's activities will dominate the landscape.
- Semiprimitive nonmotorized and wilderness recreation attributes would be foregone within 50 years.
- Elk security and big-game hunting opportunities would be reduced but mitigated through road-use management depending on site-specific needs.
- Diversity would be improved and nongame wildlife would be maintained.
- Water quality and fisheries would be adversely affected but mitigated through the use of "Best Management Practices".
- Grizzly bear and gray wolf habitat would be suboptimal but mitigated to the extent possible according to site-specific needs.
- Local economic stability would be provided by supporting the highest level of woods products industry jobs.

These prescriptions provide for a wide range of multiple-use benefits both priced and nonpriced. The flow of these benefits in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices.

Alternatives 2, 6, and 7 would have the most immediate effects on the roadless resource by accessing the most acres for timber management in Decade 1. Under the Preferred Alternative there would be no areas accessed for timber harvest in Decade 1.

f. Designation: Nonwilderness
Management Emphasis: Timber Without Roads

Alternative 2 designates 1 percent of the roadless area to roadless timber management.

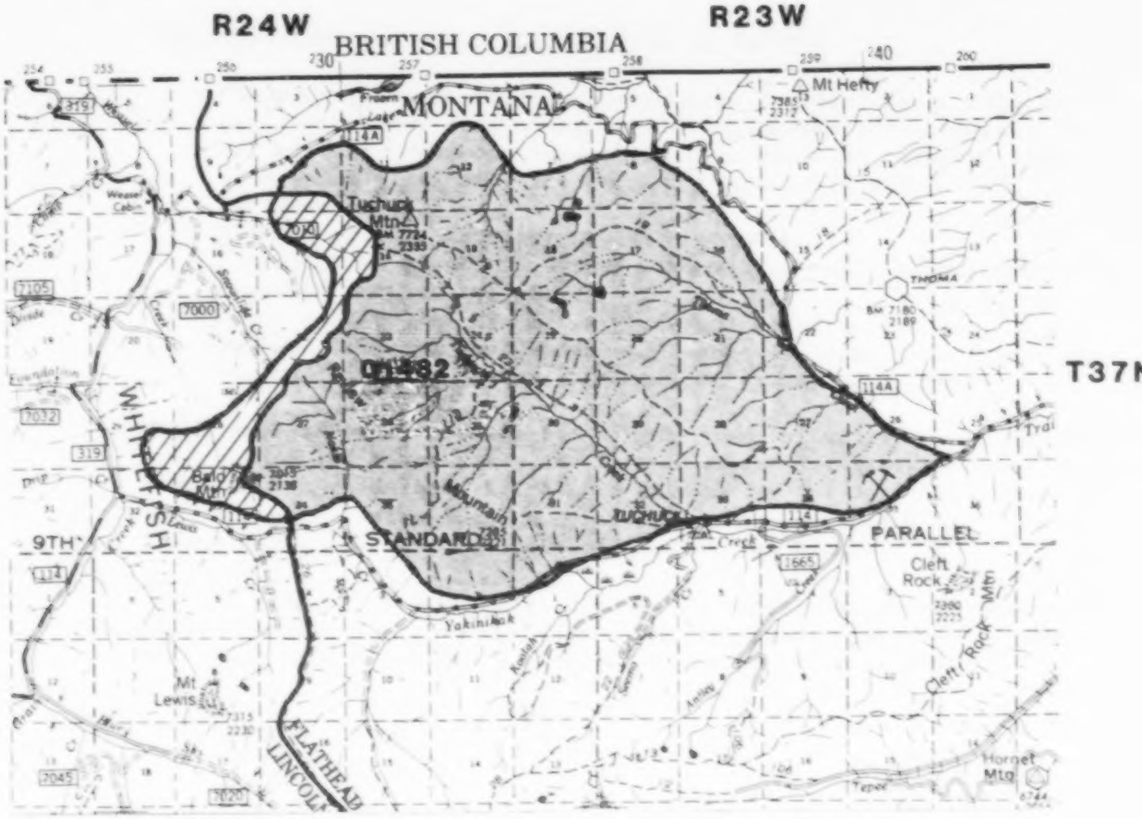
This includes areas with commercial timber potential on steep, rugged terrain mostly within 1 mile of a road. Logging would employ aerial yarding systems, and no roads would be constructed. Implementation would impact the vegetation and would not reach long distances into roadless areas. Since the land itself would not be changed, wilderness attributes could be easily reclaimed after implementation by vegetative regrowth. Implementation would proceed slowly under these prescriptions.

The nonpriced components are affected as follows:

- Visual quality objectives appropriate to local areas will be part of project design with modification the most common.
- Semiprimitive nonmotorized recreation would be provided with wilderness attributes retained or recoverable after implementation.
- Elk and grizzly security would be maintained.
- Diversity of plant and animal communities would be maintained or improved in the long term.
- Water quality and fisheries would not be affected.
- Support of local employment and income would be less than timber roaded due to the lower intensity of timber management.

These prescriptions provide for a wide range of multiple-use benefits both priced and nonpriced. The flow of these benefits in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices. No timber harvest would be scheduled until after Decade 2.

Oil and gas activity would be limited to seismic surveys, because all slopes in this management prescription are greater than 60 percent. All areas leased contain a no-surface occupancy stipulation.


R24W
R23W
BRITISH COLUMBIA
MONTANA
T37N
Mt Hefty
Tuchuck Mtn
01482
THOMA
WHITEFISH
Bald Mtn
9TH
STANDARD
TUCHUCK
PARALLEL
Cleft Rock
Cleft Rock Mtn
Yakinikak
Mt Lewis
FLATHEAD
LINCOLN
Hornet Mtn
319
114A
7019
7105
7000
7032
114
1665
7045
7020

TUCHUCK 01482
ROADLESS AREA

☐ **ROADLESS AREA ON FNF**

▨ **ROADLESS AREA ON KNF**

⚒ **PIT SITE**

SCALE

1 0 1 3

MILES

TUCHUCK 01482 (RARE II No. 01482) - FLATHEAD NATIONAL FOREST AND KOOTENAI NATIONAL FOREST

Total Gross Acres:	19,820	Total Net Acres:	19,820
Flathead National Forest	17,520	Flathead National Forest	17,520
Kootenai National Forest	2,300	Kootenai National Forest	2,300

A. DESCRIPTION

Tuchuck roadless area is located in the north end of the Flathead National Forest, 3 miles south of the Canadian border. It is one of seven roadless areas located in what is often referred to as the "North Fork". The North Fork region lies adjacent to Glacier National Park and is bordered by the North Fork of the Flathead River on the east and the Whitefish Mountain Range or Divide on the west.

The Flathead National Forest is the lead Forest for this Roadless Area Evaluation. The Kootenai National Forest portion lies within Lincoln County, and the Flathead National Forest portion is in Flathead County. The Whitefish Divide forms the Flathead - Lincoln County boundary as well as the Flathead - Kootenai National Forest boundaries.

This area borders timber harvest land on the north. The Thoma - Frozen Lake Road on the east, Trail Creek Road on the south, and the Kootenai National Forest on the west. The site is accessed by the North Fork Road from Columbia Falls and by Graves Creek Road from the west.

The area varies from 4,800 feet to 7,751 feet in elevation. Tuchuck Mountain (7,724 feet) and Review Mountain (7,286 feet) are the two highest peaks. Topography consists of typical steep, narrow alpine glaciated canyons with glacial cirque headwalls, glacial trough walls, high elevation slab rock, and glacial tills.

The site is drained primarily by Tuchuck and Thoma Creeks. There are six small lakes in the northern portion of the area, but only one is known to support a fish population.

This roadless area has some of the most important grizzly bear habitat on the Flathead National Forest. During 1983, the gray wolf activity increased significantly south of the Canadian/Montana border. All the necessary habitat components for grizzly bear and gray wolf are represented. Biologists believe the North Fork of the Flathead River drainage is the most likely location in the Rocky Mountains for reestablishing a viable gray wolf population. The area is also used as summer range by a herd of approximately 50 head of elk. Other wildlife species present include mule deer, black bear, whitetail deer, wolverine, the hoary marmot, golden eagle, and the lynx.

Most of the area burned in the 1910, 1917, and 1929 fires. The predominant tree species in the burned over area is lodgepole pine, western larch, Douglas-fir, Engelmann spruce, and subalpine fir. Alpine fir, alpine larch, and whitebark pine exist at elevations over 6,000 feet, but the overall timber productivity of this area is low.

Within the Tuchuck drainage, 1,592 acres has been proposed for designation as a research natural area because of the unique geology and vegetative community.

The area is extremely remote and has limited access which has resulted in light use by recreationists. Use occurs mostly during the big-game hunting season with minor amounts of day trips by hikers and horseback users.

B. CAPABILITY

1. NATURAL INTEGRITY AND APPEARANCE

There are very few impacts affecting the natural integrity of this area. Those impacts present include approximately 20 miles of low standard trail. Generally, the appearance of this area has been influenced by natural processes with very little impact by man.

2. OPPORTUNITIES FOR SOLITUDE

There are only a few off-site impacts, mostly in the form of timber harvests and roads. Topographic and vegetative screening is generally very good. The Tuchuck area is far from any local geographic centers and there is little chance of meeting other people within the area.

3. PRIMITIVE RECREATION OPPORTUNITIES

Because the Tuchuck roadless area is relatively small (approximately 5 miles across) the area is considered to have a low potential for primitive recreation; however, topographic and vegetative screening is considered to be very good. Also included in this area are several limestone caves providing exploration opportunities.

4. OTHER FEATURES

No endangered or threatened plant species have been identified; however, there is supposition that some areas may contain rare plant species.

Special geological features include limestone caves and several sinkholes evident in the Thoma Creek drainage.

The adjacent Trail Creek drainage was used as a major tribal route by the Kootenai Indians in their travels to and from the eastern plains on hunting expeditions.

5. MANAGEABILITY AND BOUNDARIES

There are no necessary boundary changes to be made within the Flathead National Forest portion of this area. The boundary in the Kootenai National Forest is reasonably well-defined, although it lacks strong topographic features. A portion of the boundary is located along a weakly defined edge of development (logged spruce bains) which create boundary management difficulties.

TUCHUCK ROADLESS AREA (01482)

Category	Unit	Flathead	Kootenai
Gross Acres	Acres	17,520	2,300
Net Acres	Acres	17,529	2,300
Recreation			
Primitive	RVD's	260	26
Semiprim. Nonmotor	RVD's	0	0
Semiprim. Motor	RVD's	90	20
Roaded Natural	RVD's	0	0
Range			
Exisisting Obligated			
Suitable	Acres	0	0
Allotments	No.'s	0	0
AUM's	AUM's	0	0
Existing Vacant			
Suitable	Acres	0	0
Allotments	No.	0	0
AUM's	AUM's	0	0
Proposed			
Suitable	Acres	0	0
AUM's	AUM's	0	0
Timber			
Tentative Suitable	Acres	5,442	2,000
Standing Volume	MBF	22,978	8,445
Corridors			
Exist. & Potential	No.	0	0
Wildlife - T & E			
Grizzly Bear Habitat			
Situation 1	Acres	17,520	2,300
Situation 2	Acres	0	0
Situation 3	Acres	0	0
Gray Wolf			
Habitat	Acres	17,520	2,300

Category	Unit	Flathead	Kootenai
Wildlife - Big Game			
Summer Habitat	Acres	0	0
Winter Habitat	Acres	0	0
Significant Fisheries			
Stream Miles	Miles	4	0
Stream Habitat	Hab. Ac.	0.5	0
Lakes	No.	0	0
Lake Habitat	Hab. Ac.	0	0
Water Develonments			
Existing	No.	0	0
Minerals			
Hardrock Potential			
Very High	Acres	0	0
High	Acres	0	0
Moderate	Acres	0	0
Low	Acres	17,520	2,300
Mining Claims	No.	0	0
Oil & Gas Potential			
Very High	Acres	0	0
High	Acres	17,520	2,300
Moderate	Acres	0	0
Low	Acres	0	0
Oil & Gas Potential			
Leases	No.	0	1
Leased Area	Acres	0	1,000

C. AVAILABILITY

1. RESOURCE POTENTIALS

The discussion that follows refers to resources present within this roadless area other than the previously discussed wilderness resource. The chart on the previous page summarizes the existing resources of this roadless area.

Wildlife

This area contains some of the best grizzly bear habitat in the lower 48 states and is considered very important for the recovery of the grizzly bear to a level that would allow this species to be removed from the threatened and endangered list. Recent destruction of many of the pine nut producing whitebark pine trees by the mountain pine beetle and regrowth of timber in the 1910 and 1929 burn areas, are viewed as potentially adverse to future grizzly bear production. Sustained production of essential grizzly habitat components is needed from the area to assure recovery of the grizzly bear from the threatened status.

This area is also considered important for the recovery of the endangered gray wolf.

Trail Creek (Yakinikak) and its tributaries below the mouth of Thoma Creek are closed to fishing due to spawning bull trout. Native cutthroat trout inhabit Tuchuck Creek and Upper Trail Creek. The streams within the Kootenai National Forest portion may not support habitat for fish, however, they are the headwaters to Weasel Creek, a cutthroat stream. Water quality and food organisms from these tributaries influence downstream fisheries. Weasel Lake supports cutthroat and bull trout.

Minerals

This area is within the Montana Overthrust Belt. The area is rated as having high oil and gas potential. There is continuous seismic investigation in this area. Hardrock mineral potential is considered to be low.

Timber

Whitebark pine and alpine larch are long-lived species and are major stand components above 6,000 feet in elevation. In 1978 the lodgepole pine and whitebark pine in the Tuchuck roadless area experienced an infestation of mountain pine beetle. Between 1978 and 1982, this insect has spread throughout the overmature lodgepole pine and whitebark pine stands, resulting in moderate mortality throughout this roadless area. Tuchuck is adjacent to Canada, where they have also experienced infestations of mountain pine beetle and spruce bark beetle. Extensive salvage logging of both lodgepole pine and Engelmann spruce is presently occurring on the Canadian side of the border.

There are approximately 5,400 acres of potentially suitable timberlands included in the Flathead portion of the area. Most of these stands are on steep slopes and timber management costs are generally high. There are 2,000 acres of the Kootenai National Forest portion suitable for commercial timber management.

Recreation

Recreation uses include primarily hunting and fishing, with some use from snowmobiling, cross-country skiing, camping, hiking, and horseback use along the trails.

Land Use Authorizations

There are no private inholdings or special uses within the interior of this area. There is no potential for domestic grazing.

2. MANAGEMENT CONSIDERATIONS

The area as inventoried presents moderate probability of success of wilderness management. Probability of successful management would be increased if the area were merged with the Thompson Seton area to the south and Mt. Hefty area to the northeast, to form a more manageable wilderness unit. Merged or managed separately, moderate risks would be involved in containing natural forces of fire or insect and disease outbreaks within the areas.

The area offers outstanding grizzly bear research opportunities.

High costs and low probability of success is anticipated for future grizzly bear habitat management needs if use of mechanized equipment for prescribed burning or other vegetative treatment is foregone under wilderness management.

D. NEED

1. PROXIMITY TO DESIGNATED WILDERNESSES AND TO POPULATION CENTERS

Refer to Table C-1, Parts A and B for proximity data. In addition to the National Forest wilderness and roadless areas listed in the table, the Tuchuck area is located just a few miles west of the 1,000,000 acre Glacier National Park. A large part of Glacier Park is currently being studied for wilderness classification. Additional roadless and wilderness areas are available in Canada in the form of Provincial Parks and Forests within 100 miles of Flathead National Forest. The relatively small amount of current recreational use the area receives is attributed to the fact that an abundance of high quality wilderness opportunities exist in the Forest zone of influence along with the fact that the Tuchuck area is not well known in population centers. Current use is primarily from local residents.

2. CONTRIBUTION TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM

There are few vegetative habitat types, plant or animal species, or geologic types known to exist in this area that are not currently represented in existing wilderness areas; however, a portion of this roadless area has been proposed as a Research Natural Area due to its unique topography. The area has national significance due to its potential contribution to grizzly bear/gray wolf recovery.

3. PUBLIC INTERESTS

Intensity of public opinion conflict in this area has been increased since the RARE II inventory due to the continued emergence of the national significance of potential oil and gas resources and grizzly bear habitat.

Past public involvement for the 1979 RARE II study showed that a large percentage of those responding supported nonwilderness management. The final RARE II designation was nonwilderness.

The September 1983, public involvement on the current roadless inventory on the Tuchuck area, showed that more than half of those responding favored nonwilderness management. The three "North End" roadless areas, Thompson Seton, Tuchuck, and Mt. Hefty received similar support. The expressed demand for timber harvest in the "North End" roadless areas is second highest among all Flathead roadless areas.

The public was given an opportunity to again comment on classification of this roadless area when the DEIS Supplement was released for public review in November of 1984.

There followed a great deal of public concern for the combined Mt. Hefty, Tuchuck, and Thompson Seton (includes Young-Nasukoin) roadless areas. This concern centered on protection of the grizzly bear and gray wolf. Most commenters felt that wilderness designation of these areas would provide the greatest amount of protection for these species. The timber and oil and gas interests also have strong feelings that properly controlled industrial activities can be conducted in the area without adverse effects on the bear and if properly planned, long-term benefits to bear habitat productivity could be provided.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENT BY ALTERNATIVE

The estimated acres of management emphasis for the Tuchuck roadless area are displayed in the following tabulation for all 17 Forest Plan Alternatives. The roadless area would be managed differently in the various alternatives in order to contribute appropriately to meeting Forest objectives in each case. The designations are summarized on next page by management emphasis.

2. IMPACTS

a. Designation: Wilderness
Management Emphasis: Wilderness

The entire Tuchuck roadless area is designated as wilderness under Alternatives 9, 10, 14, 15, and 16.

Wilderness designation will preserve or enhance wilderness attributes. Current uses involving motorized recreation, trail maintenance, wildlife habitat improvement, and other uses or facilities not compatible with wilderness management would be eliminated. No timber harvest would be permitted, and 7,442 acres (total, both Forests) available for timber production would be foregone.

Wilderness designation would offer not only protection for the wilderness attributes of the area but would also provide additional security for grizzly bear.

Highlighting of the area on National maps could result in more recreational pressure. Also, the option for treating vegetation for grizzly habitat component objectives through the use of natural or planned ignitions in a wilderness environment while protecting adjacent nonwilderness resources would be expensive.

Current contracts for oil and gas leases, special uses, or grazing would probably be permitted to run their course with emphasis on contract administration to protect wilderness attributes. Oil and gas exploration and development costs will be increased. Exploration activities in the nonleased portion of the area would be prohibited.

The nonpriced components are affected as follows:

- Visual quality would be preserved.
- National Wilderness Preservation System lands will increase.
- Grizzly bear, elk, and other wildlife species would have increased security.
- Diversity would tend towards climax vegetation but could be maintained near current levels if successful fire management programs were implemented.
- Water quality and fisheries quality would be maintained at natural levels.
- Local employment and income would decrease due to a reduced timber base and nonwilderness recreational opportunities.
- All nonpriced benefits of wilderness such as spiritual values, gene pool, and other scientific values and appearance will be provided.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

Management Emphasis*	Alternatives (Acres) 1/ 1	2	3	4	5	6	7	8
Wilderness	0	0	0	0	0	0	0	0
Roadless	2,300 (2,300)	16,803 (2,300)	17,418 (2,300)	17,160 (2,300)	19,820 (2,300)	12,970 (2,300)	3,070 (1,200)	2,300 (2,300)
Minimum Level	0	182	0	968	0	0	0	0
Wildlife	17,520	0	0	0	0	0	0	17,520
Timber W/Roads	0	2,835	2,402	1,692	0	6,850	16,750 (1,100)	0
Timber W/O Roads	0	0	0	0	0	0	0	0
Total	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)

Summary of Management Emphases (Both Flathead and Kootenai National Forest Acres)
(Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade								
ROADED	1 -------->	0	740	0	0	0	1,040	480	0
	5	420	2,835	2,402	1,692	0	6,850	5,581	420
ROADLESS	1 -------->	19,820	18,540	19,820	19,820	19,820	18,740	19,340	19,820
	5	19,400	16,985	17,418	18,128	19,820	12,970	14,239	19,400
WILDERNESS	1 -------->	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

1/ Includes the Kootenai National Forest acres managed under an alternative similar to the Flathead National Forest Alternative. Acres in ( ) are Kootenai National Forest portion.

The following chart displays the comparison between Flathead National Forest and Kootenai National Forest alternatives.

Flathead National Forest Alternative(s)	Kootenai National Forest Alternative(s)
1	A
2	A
3	A
4	A
5	A
6	M
7 CD	I
8	A
9	H
10	G
11	J
12	A
13	A
14	G
15	H
16	H
17PA	J

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

	Alternatives (Acres) 1/								
Management Emphasis*	9	10	11	12	13	14	15	16	17PA
Wilderness	19,820 (2,300)	19,820 (2,300)	0	0	0	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	0
Roadless	0	0	2,100 (2,100)	2,300 (2,300)	2,300 (2,300)	0	0	0	2,100 (2,100)
Minimum Level	0	0	0	0	0	0	0	0	0
Wildlife	0	0	17,720 (200)	17,520	17,520	0	0	0	17,720 (200)
Timber W/Roads	0	0	0	0	0	0	0	0	0
Timber W/O Roads	0	0	0	0	0	0	0	0	0
Total	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)	19,820 (2,300)

Summary of Management Emphases (Both Flathead and Kootenai National Forest Acres)
(Estimated Acreage fro Decade 1 with Projections for Decade 5)

	Decade									
ROADED	1 --------->	0	0	0	0	0	0	0	0	0
	5	0	0	620	420	420	0	0	0	0
ROADLESS	1 --------->	0	0	19,820	19,820	19,820	0	0	0	19,820
	5	0	0	19,200	19,400	19,400	0	0	0	19,820
WILDERNESS	1 --------->	19,820	19,820	0	0	0	19,820	19,820	19,820	0
	5	19,820	19,820	0	0	0	19,820	19,820	19,820	0

1/ Includes the Kootenai National Forest acres managed under an alternative similar to the Flathead National Forest Alternative. Acres in ( ) are Kootenai National Forest portion.

The following chart displays the comparison between Flathead National Forest and Kootenai National Forest alternatives.

Flathead National Forest Alternative(s)	Kootenai National Forest Alternative(s)
1	A
2	A
3	A
4	A
5	A
6	M
7 CD	I
8	A
9	H
10	G
11	J
12	A
13	A
14	G
15	H
16	H
17PA	J

---

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

The potential economic benefits of wilderness classification for this area are judged to be small due to the abundance of high quality wilderness within the Forest along with the low recreational carrying capacity of the area, especially in light of grizzly bear habitat needs.

b. **Designation: Nonwilderness**
Management Emphasis: Roadless

Alternatives 2-7, 11, and 17 designate from 12 percent to 100 percent of the total 19,820 acres to roadless management. There are no roadless designations made in Alternatives 9, 10, 14, 15, and 16 because the total area is designated as wilderness. Under Alternatives 11, 12, and 13, all of this roadless area would be managed as part of the Trail Creek Grizzly Bear Management Area (Refer to Chapter II, Alternative 17, Preferred Alternative, Resource Objectives).

The effect of the roadless designation is to maintain the roadless resource by establishing a management objective of keeping the area roadless. Other resources are managed subject to the primary roadless objective. Wilderness attributes may be affected to different degrees depending on the recreation or wildlife habitat objectives of local areas. Modification of natural systems to accomodate multiple-use objectives is most noticeable when trails, campsites, or other recreation facilities are constructed and maintained.

Vegetation management practices for wildlife habitat or other purposes may involve prescribed burning. Motorized equipment, such as chainsaws, helicopters, motorbikes, and snowmobiles, are often used to facilitate cost-efficient management or maintenance activities or as part of the recreation opportunities. Although these activities or uses affect wilderness attributes at the time of implementation, they are short-term effects and the wilderness attributes could be easily reclaimed by eliminating the use and allowing vegetation to regrow.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be maintained.
- Grizzly bear and other wildlife security will be maintained.
- Diversity will be maintained at current or higher levels.
- Water quality and fisheries will be maintained or improved.
- Employment and income from wood products will not be provided.
- Many nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values would be provided.

The roadless resource could be impacted by exploration and development of mineral resources. This resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. The Bureau of Land Management is the final authority for Federal mineral management. The probability of roading and development in this area is remote. If such development is proposed and implemented, it would be integrated into surface resource management to the extent that is reasonable. The most probable mineral development in this area is oil and gas. Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling. The probability of occurrence sharply diminishes with each step.

Although these activities would be mitigated to be consistent with roadless management objectives, some of the nonpriced components would be affected in the field development stage as follows:

- Existing visual conditions may be temporarily lowered.
- Introduction of roads and exploration activities adversely affect the quality of the recreation setting.
- Wildlife security would be reduced and temporary displacement from normal seasonal ranges may occur.
- Employment and income from the oil and gas resources would be provided.

c. **Designation: Nonwilderness**
Management Emphasis: Minimum Level

Minimum management is designated on areas which are not needed to meet objectives of alternatives. Alternatives 2 and 4 designate from 1 to 5 percent of the area to minimum management.

The effect of this prescription is to "do nothing" except to maintain existing improvements and resources. Alternatives 2 and 4 designate small areas which are not contiguous. The management direction may provide for roads to cross these areas to support management objectives of adjacent management units. The geographic configurations of the designations in each alternative in relation to adjacent management units determine the effects minimum management may have on wilderness attributes. The small isolated areas designated as minimum management are not needed to be managed in order to achieve the objectives of each alternative.

The nonpriced benefits are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be available but not by management design.
- Grizzly bear and other wildlife species will have security maintained.
- Diversity would tend toward climax species.
- Water quality and fisheries would not be affected by management activities.

- Minimum contribution to employment and income would result as there will be no comodity outputs and only incidental recreation use.
- Many nonpriced wilderness benefits may still be provided by this management prescription since only minimum cost care taking activities, such as fire protection, would affect the land.

d. **Designation: Nonwilderness**
Management Emphasis: Wildlife

This management emphasis includes those areas designated as grizzly bear management and riparian wildlife. Alternatives 2-7, 9, 10, 14, 15, and 16 do not designate any acreage under these management prescriptions. The remaining 5 alternatives designate all of the Flathead National Forest portion to wildlife management. Under this management emphasis, commodity outputs or recreational use of the land is subordinate to managing the natural ecosystems for wildlife habitat. Development and manipulation of vegetation may be required to achieve the habitat objectives. If such treatments involve commercial timber stands, timber harvest volume may be a byproduct of achieving or maintaining habitat objectives. The timber harvest is scheduled if the project treatments of local habitats involve enough commercial timber stands that regular periodic harvest volume can be predicted.

These prescriptions affect wilderness attributes differently than those where timber management and economics require development and a relatively high level of human activities. Due to wildlife security and cover requirements, these prescriptions require a high degree of constraints on human activities. The result is some reduction in wilderness attributes, compared to wilderness and roadless management amenities, but less than management prescriptions with timber harvest and roading as firm objectives.

The nonpriced benefits are affected as follows:

- Visual quality will be appropriate to the local area as determined for individual management areas. The most common will provide modification.
- A high level of semiprimitive recreation is provided.
- Grizzly bear and other wildlife species will have a high level of security.
- Diversity and nongame species habitat would be provided.
- Water quality and fisheries habitat will be maintained or improved.
- The prescriptions will provide some support of woods products jobs and a high level of support to recreation industry employment and income due to the role of wildlife in providing a recreation resource base.

Alternatives that designate 100 percent of the roadless area to wildlife management would maximize protection and management for grizzly bear habitat over the entire area. This management would permit activities which would maintain or improve grizzly bear habitat over the long term based on complete habitat component mapping and analysis. No development would occur in the higher elevation alpine ridges and basins, thus the roadless resource would be preserved for approximately 75 percent of the area. Due to the grizzly bear habitat emphasis, recreational use would not be encouraged. Future recreational use will be limited if conflicts with bear management are identified. Development in the suitable timberland area would proceed very slowly under grizzly emphasis. Projections estimate timber would be harvested very slowly and rotations would be 180 years or more. This management is anticipated to offset a likely decline in future bear habitat productivity due to natural processes of timber regrowth, declining huckleberry production on old burn areas, and mountain pine beetle mortality in mature pine nut producing whitebark pine stands. The appearance of the area at high elevations would continue to appear natural even though vegetative patterns may be considerably influenced by man. Where bear habitat needs require conversion of merchantable timber stands, modification of the land through conventional roading and logging is anticipated. Opportunities for solitude would likely remain very good under grizzly management due to the year-long road closures, when the roads are not being used for habitat management purposes, and the low level of activity within the area.

Under the Preferred Alternative (Alternative 17) and also under Alternatives 12 and 13, the Flathead National Forest proposes to manage a portion of the Glacier View Ranger District as the Trail Creek Grizzly Bear Management Area. This would include all of the Tuchuck roadless area, and would provide an opportunity for research while providing a high level of security for the grizzly bear.

Oil and gas activity may occur even though it is not designated. Effects from this activity would be the same as discussed under the Roadless Management Prescription.

e. **Designation: Nonwilderness**
Management Emphasis: Timber with Roads

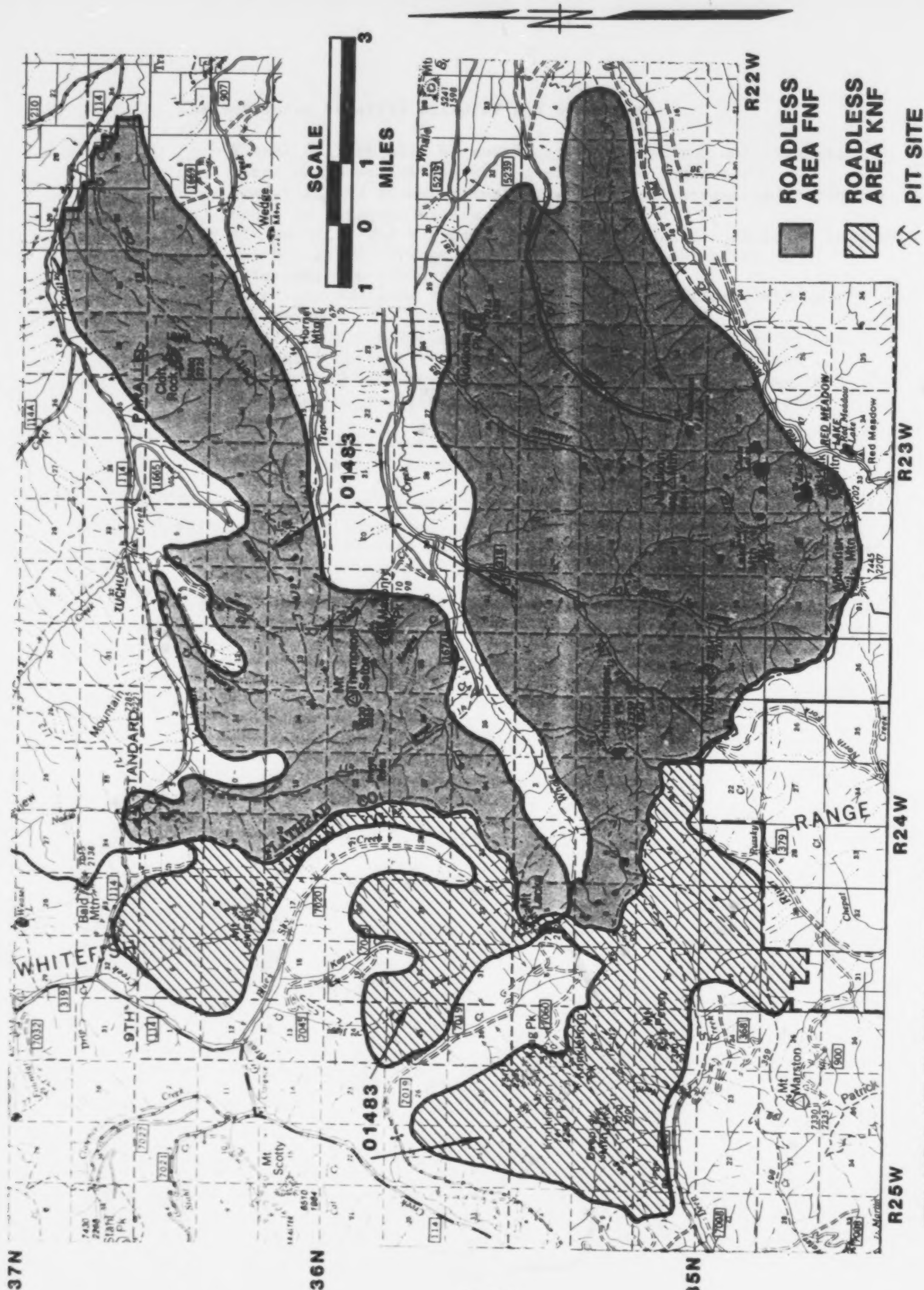
Alternatives 2-4, 6, and 7 designate from 12 to 79 percent of the total roadless area as roaded timber management. The consequences of these designations is a loss of wilderness attributes at the time of implementation of timber harvest or support activities requiring roads. The roadless resource and wilderness attributes of natural integrity, natural appearance, opportunity for solitude, and primitive recreation are foregone when these management prescriptions are implemented.

The nonpriced benefits affected are as follows:

- Visual quality will be modification or maximum modification where man's activities will dominate the landscape.
- Semiprimitive nonmotorized and wilderness recreation attributes would be foregone within 50 years.
- Elk security and big-game hunting opportunities would be reduced but mitigated through road-use management depending on site-specific needs.
- Diversity would be improved and nongame wildlife would be maintained.
- Water quality and fisheries would be adversely affected but mitigated through the use of "Best Management Practices".
- Grizzly bear and gray would habitat would be suboptimal but mitigated to the extent possible according to site-specific needs.
- Local economic stability would be provided by supporting the highest level of woods products industry jobs.

These prescriptions provide for a wide range of multiple-use benefits both priced and nonpriced. The flow of these benefits in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices.

Alternatives 6 and 7 would have the most immediate effects on the roadless resource by accessing the most acres for timber management in Decade 1.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RANGE
FLATHEAD
LINCOLN
Mt Thompson Seton
Colt Rock
Mt Scotty
Mt Marston
Bald Mtn
Stahl Pk
RED MEADOW
Red Meadow Lake
Mt Peters
Werner Pk
Whitefish Mtn
Tuchuck
Hornet Mtn
Wedge
Whale
Patrick
Mountain
Creek

THOMPSON-SETON ROADLESS AREA

THOMPSON SETON 01483 (RARE II NO. 01483, RARE I NOS., 171, 124-125) - FLATHEAD NATIONAL FOREST AND KOOTENAI NATIONAL FOREST

Total Gross Acres:	71,750	Total Net Acres:	71,750
Flathead National Forest	52,650	Flathead National Forest	52,650
Kootenai National Forest	19,100	Kootenai National Forest	19,100

A. DESCRIPTION

Thompson Seton roadless area is located in the north end of the Flathead National Forest, 6 miles south of the Canadian border. It is one of seven roadless areas located in what is often referred to as the "North Fork." The North Fork region lies adjacent to Glacier National Park and is bordered by the North Fork of the Flathead River on the east and the Whitefish Mountain Range or Divide on the west.

The Flathead National Forest is the lead Forest for this roadless area evaluation. The Kootenai National Forest portion lies within Lincoln County, and the Flathead National Forest portion is in Flathead County. The Whitefish Divide forms the Flathead - Lincoln County boundary as well as the Flathead - Kootenai National Forest boundaries.

This area is generally bounded on the north by the Trail Creek Road, on the east by roaded timberland, on the south by the Red Meadow and Deep Creek Roads and other roaded Forest land and on the west by the Williams Creek, Graves Creek, and Blue Sky Creek Roads. Whale Creek, Blue Sky Creek, and Williams Creeks are roaded and form deep incisions into this roadless area. Also, old, low standard roads penetrate into the Shorty Creek and Moose Creek drainages. These roads have been closed to public use for many years; hence, this area is considered by some people to be essentially roadless.

The topographical character of the area consists of rugged mountainous terrain, with several major peaks over 7,000 feet, forested ridges and steep narrow glaciated canyons. Major peaks include: Cleft Rock, Mt. Thompson Seton, Mt. Locke, Mt. Lewis, Krinklehorn Peak, Deep Mountain, Mt. Petery, Huntsberger Peak, Mt. Young, Lake Mountain, Whitefish Mountain, Link Mountain, Akinkoka Peak, and Nasukoin Mountain. Nasukoin Mountain at 8,086 feet, is the highest peak in the Whitefish Mountain Range. Valley bottoms range as low as 4,200 feet.

Major drainages include: Shorty Creek, Moose Creek, Akinkoka Creek, Cleft Creek, Inuya Creek, Yakinakak Creek, Ninko Creek, and Teepee Creek. Much of the area consists of broad ridges between drainages such as Trail, Whale, Red Meadow, Williams, Deep, and Blue Sky Creek.

Much of the northern and eastern portion of the area burned in the 1910, 1917, and 1929 fires. The predominant tree species in the burned-over areas are lodgepole pine and larch. Primary ecosystems present include whitebark pine/subalpine fir on the ridgetops, and subalpine fir/bear grass on the southeast to southwest aspects. Timber types vary from whitebark pine at the upper limits to Engelmann spruce at the lower limits. There is considerable volume of commercial timber in this area.

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This area includes some of the finest grizzly bear habitat in the United States. It contains all the necessary grizzly bear habitat components* as well as key population centers. Sightings of the gray wolf, an endangered species, has increased during 1983. It is believed that wolves from Canada are becoming established in this area. Biologists believe the North Fork of the Flathead River drainage is the most likely location in the Rocky Mountains for reestablishing a viable gray wolf population.

Other wildlife species present include mule deer, black bear, whitetailed deer, wolverine, the hoary marmot, golden eagle, and the lynx. There is a possibility of occasional use of this area by mountain caribou ranging down from Canada. Efforts are being made to confirm the existence and extent of caribou use through special surveys and observations by work crews and cooperators.

Whale Creek and the Whale Lake area is an important fishery for bull trout. The number of high mountain lakes within the area makes this roadless unit unique from others on the District. There are approximately 15 lakes, including those known as the Chain Lakes. Several lakes in the Mt. Young area provide a good trout fishery.

Scenic attractiveness of the area is very good due to the variety of landscapes within the area and the adjacent scenes into Glacier Park from the Whitefish range. The area is extremely remote and has limited access, which has resulted in light use by recreationists. Present use consists primarily of fall big-game hunting with lessor amounts of day-use trips by hikers and horseback users. A portion of the Whitefish Divide Trail south of Mt. Young has been designated a National Recreational Trail. This trail would terminate at the Meadow Creek Road on the southern boundary of the area. The land around Red Meadow Lake is noted for its scenic value in the fall when the shrub covered slopes around the lake turn color.

B. CAPABILITY

1. NATURAL INTEGRITY AND APPEARANCE

This roadless area, as it stands, has many intrusions around the edges in the form of existing roads and scars left by old logging roads. Also, there are many visible cutting units, especially in the Shorty Creek Area which has been managed as a roadless area for several years under the current Land Management Unit Plan. Some respondents objected to the inclusion of old roads and cutting units in the roadless inventory. These intrusions do impact the natural integrity of the area; however, it is felt that these impacts can be lessened with time and boundary adjustments. After boundary adjustments, the effect of human activity in the area would be minor and natural integrity judged to be high.

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* Refer to "The Influence of Logging and Wildfire on Grizzly Bear Habitat in Northwestern Montana," by Peter Edward Zager, 1980.

Internal impacts consist of the Thompson Seton Lookout and approximately 26 miles of low standard trail, but these impacts do not appreciably alter the long-term ecological processes. The appearance of this area has been influenced by natural processes with very little impact by man other than the previously mentioned roads and trails. Visitors to the area would feel that the greater portion maintains a natural appearance.

2. OPPORTUNITIES FOR SOLITUDE

There are many off-site intrusions in the form of timber harvest and roads penetrating the area. However, opportunities for solitude do exist over the greater portion of this area. The distance from perimeter to core varies from less than 1 mile to approximately 7 miles with good vegetative and topographic screening, and the extensive trail system allows a visitor to get away from the off-site intrusions.

3. PRIMITIVE RECREATION OPPORTUNITIES

The area has a moderate potential for primitive recreation opportunity. There is evidence of previous logging activities and roads, but this is localized and the majority of the area has not been impacted by man's activities. The diversity of the terrain adds to the visitor's primitive experience. Particularly rugged and challenging terrain is found in the Deep Creek - Mt. Krinklehorn and Thompson Seton vicinities.

4. OTHER FEATURES

The area is considered to have good scenic value due to the numerous mountain lakes within the area and the panoramic views into Glacier National Park from the ridges.

5. MANAGEABILITY AND BOUNDARIES

This area generally contains well-defined boundaries set along topographic features or along roads. The boundaries could be adjusted to exclude the old roads and thus improve the wilderness characteristics. Conversely, inclusion of these intrusions would be desirable from a manageable boundary standpoint if the area should be managed as wilderness.

Approximately 6,490 acres have been added to the Thompson Seton RARE II inventory in the Young-Nasukoin area. RARE II did not inventory these areas, because they were already designated in the North Fork Unit Plan when the inventory was conducted. An additional 10,400 acres were added from the Kootenai National Forest Deep Creek area for the same reason, and 3,000 more from updated mapping of contiguous roadless area. A downward adjustment of 700 acres was made after recalculating the area using current data base information. After considering public comments expressing concern or opposition to including some old logging roads and cutting units in the Shorty Creek area, it was decided not to adjust the roadless inventory boundary. The reason for this is that most of the area with intrusions had been designated and managed as a roadless area by the North Fork Unit Plan and therefore, it should receive evaluation for wilderness management.

MT THOMPSON-SETON ROADLESS AREA

Category	Unit	Flathead	Kootenai
Gross Acres	Acres	52,650	19,100
Net Acres	Acres	52,650	19,000
Recreation			
Primitive	RVD's	0	0
Semiprim. Nonmotor	RVD's	788	403
Semiprim. Motor	RVD's	324	0
Roaded Natural	RVD's	288	0
Range			
Exisisting Obligated			
Suitable	Acres	0	0
Allotments	No.'s	0	0
AUM's	AUM's	0	0
Existing Vacant			
Suitable	Acres	0	0
Allotments	No.	0	0
AUM's	AUM's	0	0
Proposed			
Suitable	Acres	0	0
AUM's	AUM's	0	0
Timber			
Tentative Suitable	Acres	14,290	4,700
Standing Volume	MBF	96,028	30,000
Corridors			
Exist. & Potential	No.	1	1
Wildlife - T & E			
Grizzly Bear Habitat			
Situation 1	Acres	52,650	19,100
Situation 2	Acres	0	0
Situation 3	Acres	0	0
Gray Wolf			
Habitat	Acres	52,650	19,100

Category	Unit	Flathead	Kootenai
Wildlife - Big Game			
Summer Habitat	Acres	0	0
Winter Habitat	Acres	0	0
Significant Fisheries			
Stream Miles	Miles	13	0
Stream Habitat	Hab. Ac.	15	0
Lakes	No.	8	0
Lake Habitat	Hab. Ac.	87	0
Water Developments			
Existing	No.	0	0
Minerals			
Hardrock Potential			
Very High	Acres	0	0
High	Acres	0	0
Moderate	Acres	0	0
Low	Acres	52,650	19,100
Mining Claims	No.	0	0
Oil & Gas Potential			
Very High	Acres	0	0
High	Acres	52,650	19,100
Moderate	Acres	0	0
Low	Acres	0	0
Oil & Gas Potential			
Leases	No.	15	2
Leased Area	Acres	27,727	2,000

C. AVAILABILITY

1. RESOURCE POTENTIALS

The discussion that follows refers to resources present within this roadless area other than the previously discussed wilderness resource. The chart on the previous page summarizes the existing resource potential for this roadless area.

Wildlife

This area contains some of the best grizzly bear habitat in the lower 48 states and is considered very important for the recovery of the grizzly bear to a level that would allow this species to be removed from the threatened and endangered list. Recent destruction of many of the pine nut producing whitebark pine trees by the mountain pine beetle and regrowth of timber in the 1910 and 1929 burn areas, are viewed as potentially adverse to future grizzly bear production. Sustained production of essential grizzly bear habitat components is needed from the area to assure recovery of the grizzly bear from the threatened status.

This area is also considered important for the recovery of the endangered gray wolf.

The headwaters of Blue Sky, Williams, Whale, and Lewis Creek provide habitat for both migratory and resident cutthroat and bull trout and contain spawning habitat. Upper Deep Creek runs through this area and supports cutthroat and brook trout with the lower reaches also having bull and rainbow trout. Also included are the headwaters for Williams and Deep Creek.

Minerals

This area is within the Montana Overthrust Belt. The area is rated as having high oil and gas potential. There is continuous seismic investigation in this area. Hardrock mineral potential is considered to be low.

Timber

Whitebark pine and alpine larch are long-lived species and are major stand components above 6,000 feet in elevation. In 1978 the lodgepole pine and whitebark pine in the Thompson Seton roadless area began experiencing an epidemic infestation of mountain pine beetle. Between 1978 and 1982 this insect had spread throughout the lodgepole pine and whitebark pine stands resulting in moderate mortality throughout this roadless area. The spruce bark beetle is active in the Kootenai National Forest portions of the area. This mortality results in a buildup of ground fuel and greatly increases the risk of large wildfires.

There are approximately 14,000 acres of potentially suitable timberlands included in the Flathead portion of the area. Most of these stands are on steep slopes and timber management costs are generally high. Little of the Kootenai National Forest portion of the area is suitable for commercial timber management.

Recreation

Recreation uses include hunting and fishing, with some use from snowmobiling, cross-country skiing, camping, hiking, and horseback use along the numerous trails. The relatively small amount of current recreational use the area receives is attributed to the fact that an abundance of high quality wilderness opportunities exist in the Forest zone of influence along with the fact that the Thompson Seton area is not well known in population centers. Current use is primarily from local residents.

Land Use Authorizations

There are no private inholdings or special uses within this area. There is no potential for domestic grazing.

2. MANAGEMENT CONSIDERATIONS

The area as inventoried presents moderate probability for successful wilderness management. Probability of successful management would be increased if the area were merged with the Tuchuck and Mt. Hefty areas to the north, to form a more manageable wilderness unit. Merged or managed separately, moderate risks would be involved in containing the natural forces of fire or insect and disease outbreaks within the areas.

The area offers outstanding grizzly bear research opportunities.

High costs and low probability of success is anticipated for future grizzly habitat management needs if use of mechanized equipment for prescribed burning or other vegetative treatment is foregone under wilderness management.

D. NEED

1. PROXIMITY TO DESIGNATED WILDERNESSES AND TO POPULATION CENTERS

Refer to Table C-1, Part A and B for proximity data. In addition to the National Forest wilderness and roadless areas listed in the table, the Thompson Seton area is located just a few miles west of the 1,000,000 acre Glacier National Park. A large part of Glacier Park is currently being studied for wilderness classification. Additional roadless and wilderness areas are available in Canada in the form of Provincial Parks and Forests within 100 miles of Flathead National Forest.

2. CONTRIBUTION TO THE NATIONAL WILDERNESS PRESERVATION SYSTEM

The vegetative habitat types, plant species, most animal species, and geologic types known to exist in this area are well represented in existing wilderness areas. The area has national significance due to its potential contribution to grizzly bear/gray wolf recovery.

3. PUBLIC INTERESTS

Past public involvement for the 1979 RARE II study showed that half of those responding supported nonwilderness management. The final RARE II designation was nonwilderness.

Intensity of public opinion conflict in this area has been increased since the RARE II process due to the continued emergence of national issues such as potential oil and gas resources and grizzly bear habitat.

The September 1983 public involvement on the current roadless inventory on the Thompson Seton area, showed that more than half of those responding favored nonwilderness management. The three "North End" roadless areas, Thompson Seton, Tuchuck, and Mt. Hefty received similar support. The Young-Nasukoin area and the Kootenai Deep Creek areas had lower levels of expressed interest for wilderness than the Thompson Seton portion inventoried in RARE II. The expressed demand for timber harvest in the "North End" roadless areas is second highest among all Flathead roadless areas.

The public was given an opportunity to again comment on classification of this roadless area when the DEIS Supplement was released for public review in November of 1984.

There followed a great deal of public concern for the combined Mt. Hefty, Tuchuck, and Thompson Seton (includes Young-Nasukoin) roadless areas. This concern centered on protection of the grizzly bear and gray wolf. Most commenters felt that wilderness designation of these areas would provide the greatest amount of protection for these species. Timber and oil and gas interests have strong feelings that properly controlled industrial activities can be conducted in the area without adverse effects on the bear and if properly planned, long-term benefits to bear habitat productivity could be provided.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENT BY ALTERNATIVE

The estimated acres of management emphasis for the Thompson Seton roadless area are displayed in the following tabulation for all 17 Forest Plan Alternatives. The roadless area would be managed differently under the various alternatives in order to contribute appropriately to meeting the Forest objectives in each case. The designations are summarized below by management emphasis.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

Management Emphasis*	Alternatives (Acres) 1/ 1	2	3	4	5	6	7	8
Wilderness	0	0	0	0	0	0	0	0
Roadless	20,705 (16,300)	51,520 (16,300)	56,360 (16,300)	32,282 (16,300)	65,800 (16,300)	53,820 (15,600)	16,820 (16,000)	29,015 (16,300)
Minimum Level	0	2,834	0	26,280	950	0	0	0
Wildlife	48,245	0	0	0	0	40	30,350	36,154
Timber W/Roads	2,800 (2,800)	16,681 (2,800)	12,519 (2,800)	13,153 (2,800)	5,000 (2,800)	17,890 (3,500)	24,580 (3,100)	5,299 (2,800)
Timber W/O Roads	0	715	2,871	35	0	0	0	1,282
Total	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)

Summary of Management Emphases (Both Flathead and Kootenai National Forest Acres)
(Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade								
ROADED	1 -------->	700	3,920	1,600	600	500	6,620	4,240	2,250
	5	11,261	17,396	15,390	13,188	5,000	17,890	24,580	6,556
ROADLESS	1 -------->	71,050	67,830	70,150	71,150	71,250	65,130	67,510	69,500
	5	60,489	54,354	56,360	58,562	66,750	53,860	47,170	65,194
WILDERNESS	1 -------->	0	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0	0

1/ Includes the Kootenai National Forest acres managed under an alternative similar to the Flathead National Forest Alternative. Acres in ( ) are Kootenai National Forest portion.

The following chart displays the comparison between Flathead National Forest and Kootenai National Forest alternatives.

Flathead National Forest Alternative(s)	Kootenai National Forest Alternative(s)
1	A
2	A
3	A
4	A
5	A
6	M
7 CD	I
8	A
9	H
10	G
11	J
12	A
13	A
14	G
15	H
16	H
17PA	J

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* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

ESTIMATED ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE

Management Emphasis*	Alternatives (Acres) 1/ 9	10	11	12	13	14	15	16	17PA
Wilderness	71,750 (19,100)	28,000 (5,700)	0	0	0	28,000 (5,700)	71,750 (19,100)	71,750 (19,100)	0
Roadless	0	36,120 (8,900)	30,515 (17,800)	29,015 (16,300)	29,015 (16,300)	20,677 (8,900)	0	0	18,935 (17,800)
Minimum Level	0	930	0	0	0	0	0	0	0
Wildlife	0	0	36,554 (400)	36,154	36,154	16,074	0	0	50,895 (400)
Timber W/Roads	0	6,700 (4,500)	3,399 (900)	5,299 (2,800)	5,299 (2,800)	6,999 (4,500)	0	0	1,402 (900)
Timber W/O Roads	0	0	1,282	1,282	1,282	0	0	0	518
Total	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)	71,750 (19,100)

Summary of Management Emphases (Both Flathead and Kootenai National Forest Acres)
(Estimated Acreage for Decade 1 with Projections for Decade 5)

	Decade	9	10	11	12	13	14	15	16	17PA
ROADED	1 -------->	0	500	2,000	2,000	2,000	1,140	0	0	1,200
	5	0	6,700	7,915	12,214	12,214	9,699	0	0	5,028
ROADLESS	1 -------->	0	43,250	69,775	69,775	69,775	70,610	0	0	70,550
	5	0	37,050	63,835	59,536	59,536	34,051	0	0	66,722
WILDERNESS	1 -------->	71,750	28,000	0	0	0	28,000	71,750	71,750	0
	5	71,750	28,000	0	0	0	28,000	71,750	71,750	0

1/ Includes the Kootenai National Forest acres managed under an alternative similar to the Flathead National Forest Alternative. Acres in ( ) are Kootenai National Forest portion.

The following chart displays the comparison between Flathead National Forest and Kootenai National Forest alternatives.

Flathead National Forest Alternative(s)	Kootenai National Forest Alternative(s)
1	A
2	A
3	A
4	A
5	A
6	M
7 CD	T
8	A
9	H
10	G
11	J
12	A
13	A
14	G
15	H
16	H
17PA	J

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, of this roadless area writeup for further discussion.

2. IMPACTS

a. Designation: Wilderness
Management Emphasis: Wilderness

The entire Thompson Seton roadless area is designated as wilderness under Alternatives 9, 15, and 16. Alternatives 10 and 14 recommend for wilderness only the northern portion of the area.

Wilderness designation will preserve or enhance wilderness attributes. Current uses which may not conform with wilderness management include oil and gas leasing. Of the 71,750 acres, 29,727 acres have been leased. No timber harvest would be permitted, and 18,990 acres available for timber production would be foregone.

Wilderness designation would offer not only protection for the wilderness attributes of the area but would also provide additional security for grizzly bear.

Highlighting of the area on National maps could result in more recreational pressure. Also, the option for treating vegetation for grizzly habitat component objectives through the use of natural or planned ignitions in a wilderness environment while protecting adjacent nonwilderness resources would be expensive.

Current contracts for oil and gas leases, special uses, or grazing would probably be permitted to run their course with emphasis on contract administration to protect wilderness attributes. Oil and gas exploration and development costs would be increased. Exploration activities in the nonleased portion of the area would be prohibited.

The nonpriced components are affected as follows:

- Visual quality would be preserved.
- National Wilderness Preservation System lands will increase.
- Grizzly bear, elk, and other wildlife species would have increased security.
- Diversity would tend towards climax vegetation but could be maintained near current levels if successful fire management programs were implemented.
- Water quality and fisheries quality would be maintained at natural levels.
- Local employment and income would decrease due to a reduced timber base and nonwilderness recreational opportunities.
- Nonpriced spiritual, scientific, and esthetic values would be fully preserved.
- All nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values would be provided.

The potential economic benefits of wilderness classification for this area are judged to be small due to the abundance of high quality wilderness on the Forest along with the low recreational carrying capacity of the area especially in light of grizzly bear habitat needs.

b. **Designation: Nonwilderness**
Management Emphasis: Roadless

Alternatives 1-8, 10, and 14, designate from 1 percent of the total 19,100 acres, to 93 percent to roadless management. There are no roadless designations made in Alternatives 9, 15, and 16 because the total area is designated as wilderness. Under Alternatives 11, 12, and 13, a large portion of this roadless area would be managed as part of the Trail Creek Grizzly Bear Management Area (Refer to Chapter II, Page II-25, Alternative 17 Preferred Alternative, Resource Objectives).

The effects of the roadless designation is to maintain the roadless resource by establishing a management objective of keeping the area roadless. Other resources are managed subject to the primary roadless objective. Wilderness attributes may be affected to different degrees depending on the recreation or wildlife habitat objectives of local areas. Modification of natural systems to accommodate multiple-use objectives is most noticeable when trails, campsites, or other recreation facilities are constructed and maintained.

Vegetation management practices for wildlife habitat or other purposes may involve prescribed burning. Motorized equipment, such as chainsaws, helicopters, motorbikes, and snowmobiles, are often used to facilitate cost-efficient management or maintenance activities or as part of the recreation opportunities. Although these activities or uses affect wilderness attributes at the time of implementation, they are short-term effects and the wilderness attributes could be easily reclaimed by eliminating the use and allowing vegetation to regrow.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be maintained.
- Grizzly bear and other wildlife security will be maintained.
- Diversity will be maintained at current or higher levels.
- Water quality and fisheries will be maintained or improved.
- Employment and income from woods products will not be provided.
- Many nonpriced benefits of wilderness such as spiritual values, natural appearance, gene pool, and other scientific values would be provided.

The roadless resource could be impacted by exploration and development of mineral resources. This resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. The Bureau of Land Management is the final authority for Federal mineral management. The probability of roading and development in this area is remote. If such development is proposed and implemented, it would be integrated into surface resource management to the extent that is reasonable. The most probable mineral development in this area is oil and gas. Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling. The probability of occurrence sharply diminishes with each step.

Although these activities would be mitigated to be consistent with roadless management objectives, some of the nonpriced components would be affected in the field development stage as follows:

- Existing visual conditions may be temporarily lowered.
- Introduction of roads and exploration activities adversely affect the quality of the recreation setting.
- Wildlife security would be reduced and temporary displacement from normal seasonal ranges may occur.
- Employment and income from the oil and gas resource would be provided.

c. **Designation: Nonwilderness**
Management Emphasis: Minimum Level

Minimum management is designated on areas which are not needed to meet objectives of alternatives. Alternatives 2, 4, 5, and 10 designate from 1 to 37 percent of the area to minimum management.

The effect of this prescription is to "do nothing" except to maintain existing improvements and resources. In Alternative 4 which designates a large contiguous area to this prescription, no developments would occur due to surface resources. Alternatives 2, 5, and 10 designate small areas which are not contiguous. The management direction may provide for roads to cross these areas to support management objectives of adjacent management units. The geographic configurations of the designations in each alternative in relation to adjacent management units determine the effects minimum management may have on wilderness attributes. The small isolated areas designated as minimum management do not need to be managed in order to achieve the objectives of each alternative. Alternative 4 designates substantial roadless areas to this prescription to minimize costs and maximize revenues. These areas are the lands between the suitable timberlands and the ridgetop recreation trails.

The nonpriced components are affected as follows:

- Visual quality will be retained.
- Semiprimitive motorized and nonmotorized and primitive recreation opportunities will be available but not by management design.

- Grizzly bear and other wildlife species will have security maintained.
- Diversity would tend toward climax species.
- Water quality and fisheries would not be affected by management activities.
- Minimum contribution to employment and income would result as there will be no commodity outputs and only incidental recreation use.
- Many nonpriced wilderness benefits may be provided by this management prescription since only minimum cost care taking activities, such as fire protection, would affect the land.

d. **Designation: Nonwilderness**
Management Emphasis: Wildlife

This management emphasis includes those areas designated as grizzly bear management and riparian/wildlife. Alternatives 2-5, 9, 10, 15, and 16 do not designate any acreage under these management prescriptions. The remaining 8 alternatives designate from less than 1 percent in Alternative 6 to 67 percent in Alternative 1. Under this management emphasis, commodity outputs or recreational use of the land is subordinate to managing the natural ecosystems for wildlife habitat. Development and manipulation of vegetation may be required to achieve the habitat objectives. If such treatments involve commercial timber stands, timber harvest volume may be a byproduct of achieving or maintaining habitat objectives. The timber harvest is scheduled if the project treatments of local habitats involve enough commercial timber stands that regular periodic harvest volume can be predicted.

These prescriptions affect wilderness attributes differently than those where timber management and economics require development and a relatively high level of human activities. Due to wildlife security and cover requirements, these prescriptions require a high degree of constraint on human activities. The result is some reduction in wilderness attributes compared to wilderness and roadless management amenities, but less than management prescriptions with timber harvest and roading as firm objectives.

The nonpriced components are affected as follows:

- Visual quality will be appropriate to the local area as determined for individual management areas. The most common will provide modification.
- A high level of semiprimitive recreation is provided.
- Grizzly bear and other wildlife species will have a high level of security.
- Diversity and nongame species habitat would be provided.
- Water quality and fisheries habitat will be maintained or improved.
- The prescriptions will provide some support of woods products jobs and a high level of support to recreation industry employment and income due to the role of wildlife in providing a recreation resource base.

Alternative 1 would maximize protection and management for grizzly bear habitat over most of the area. This management would permit activities which would maintain or improve grizzly bear habitat over the long term based on complete habitat component mapping and analysis. No development would occur in the higher elevation alpine ridges and basins thus, the roadless resource would be preserved for approximately 75 percent of the area. Due to the grizzly habitat emphasis, recreational use in areas such as the Chain Lakes area would not be encouraged. Future recreational use will be limited if conflicts with bear management are identified. Development in the suitable timberland area would proceed very slowly under grizzly emphasis. Projections estimate timber would be harvested very slowly and rotations would be 180 years or more. This management is anticipated to offset a likely decline in future bear habitat productivity due to natural processes of timber regrowth, declining huckleberry production on old burn areas and mountain pine beetle mortality in mature pine nut producing whitebark pine stands. The area at high elevations would continue to appear natural even though vegetative patterns may be considerably influenced by man. Where bear habitat needs require conversion of merchantable timber stands, modification of the land, through conventional roading and logging, is anticipated. Opportunities for solitude would likely remain very good under grizzly bear management due to the year-long road closures when they are not being used for habitat management purposes and the low level of activities.

Under the Preferred Alternative (Alternative 17) and also under Alternatives 12 and 13, the Flathead National Forest proposes to manage a portion of the Glacier View Ranger District as the Trail Creek Grizzly Bear Management Area. This would include a large portion of the Thompson Seton roadless area, and would provide an opportunity for research while providing a high level of security for not only the grizzly bear, but other wildlife species as well.

Oil and gas activity may occur even though it is not designated. Effects from this activity would be the same as discussed under the Roadless Management Prescription.

e. **Designation: Nonwilderness**
Management Emphasis: Timber with Roads

Alternatives 1-8 and 10-14 designate from 3 to 44 percent of the total roadless area to roaded timber management. The consequences of these designations are a loss of wilderness attributes at the time of implementation of timber harvest or support activities requiring roads. The roadless resource and wilderness attributes of natural integrity, natural appearance, opportunity for solitude, and primitive recreation are foregone when these management prescriptions are implemented.

The nonpriced components are affected as follows:

- Visual quality will be modification or maximum modification where man's activities will dominate the landscape.
- Semiprimitive nonmotorized and wilderness recreation attributes would be foregone within 50 years.
- Elk security and big-game hunting opportunities would be reduced but mitigated through road-use management depending on site-specific needs.
- Diversity would be improved and nongame wildlife would be maintained.
- Water quality and fisheries would be adversely affected but mitigated through the use of "Best Management Practices".
- Grizzly bear and gray wolf habitat would be suboptimal but mitigated to the extent possible according to site-specific needs.
- Local economic stability would be provided by supporting the highest level of woods products industry jobs.

These prescriptions provide for a wide range of multiple-use benefits both priced and nonpriced. The flow of these benefits in place of roadless and wilderness attributes depends on the specific location and timing of implementation of timber management practices.

Alternative 6 would have the most immediate effects on the roadless resource by accessing the most acres for timber management in Decade 1. Under the Preferred Alternative the only areas accessed for only areas accessed for timber harvest in Decade 1 are east of Nasukoin Mountain in the lower elevations of the Flathead National Forest portion. The Kootenai National Forest's Preferred Alternative designates in Decade 1 approximately 600 acres to timber management in the Graves Creek area and another smaller portion in the Deep Creek area.

f. **Designation: Nonwilderness**
Management Emphasis: Timber Without Roads

Alternatives 2-4, 8, and 11-14 designate from less than 1 percent of the roadless area in Alternative 4 to 4 percent in Alternative 3 towards roadless timber management.

These are areas with commercial timber potential on steep, rugged terrain mostly within 1 mile of a road. Logging would employ aerial yarding systems, and no roads would be constructed. Implementation would impact the vegetation and would not reach long distances into roadless areas. Since the land itself would not be changed, wilderness attributes could be easily reclaimed after implementation by vegetative regrowth. Implementation would proceed slowly for all alternatives designating these prescriptions. Only a few acres would be affected in Decades 1 and 2. Most designated areas would have harvesting by Decade 5 when economic efficiency of the prescription are projected to be best. The prescription would not make significant changes in economic or social effects until Decade 4, when implementation is projected to increase. The first decade timber harvest scheduled under this prescription could be relocated to other areas without affected objectives or outputs of the alternative.

The nonpriced components are affected as follows:

- Visual quality objectives appropriate to local areas will be part of project design with modification the most common VQO.
- Semiprimitive nonmotorized recreation would be provided with wilderness attributes retained or recoverable after implementation.
- Elk and grizzly security would be maintained.
- Diversity of plant and animal communities would be maintained or improved in the long term.
- Water quality and fisheries would not be affected.
- Support of local employment and income would be less than timber roaded due to the lower intensity of timber management.

Oil and gas activity would be limited to seismic surveys, because all slopes in this management prescription are greater than 60 percent. All areas leased contain a no-surface occupancy stipulation.

BEAR-MARSHALL-SCAPEGOAT-SWAN 01485 - FLATHEAD NATIONAL FOREST

Total Gross Acres:	866,330	Total Net Acres:	865,178
Flathead National Forest	348,950	Flathead National Forest	348,950
Helena National Forest	58,752	Helena National Forest	58,700
Lolo National Forest	121,940	Lolo National Forest	120,900
Lewis & Clark National Forest	336,688	Lewis & Clark National Forest	336,628

(Refer to the enclosed folded map of the Bear-Marshall-Scapegoat-Swan Area Map)

A. DESCRIPTION

The Bear-Marshall-Scapegoat-Swan roadless area is located in the Northern Continental Divide Ecosystem. This roadless area surrounds the Bob Marshall, Great Bear, and Scapegoat Wildernesses. It also includes portions of the Swan Range north of the Bob Marshall Wilderness near Inspiration Point and Alcove Mountain to the Columbia Mountain locale near Columbia Falls, Montana.

This area includes portions of Flathead, Lake, Missoula, Glacier, Pondera, Teton, Lewis and Clark, and Powell Counties in the Flathead, Lewis and Clark, Helena, and Lolo National Forests.

From the east side, access is very limited. Less than a dozen access points exist in the 75 miles of Forest boundary. Much of the roadless area boundary is adjacent to private land; thus right-of-way is required for any new access points. The eastern portion can be accessed by the North Fork Teton River Road, South Fork Teton River Road, Sun River Canyon Road, Beaver/Willow Creek Road, Benchmark Road, and Elk Creek Road. Major access to the northeast portion can be gained by roads and trails that originate from U.S. Highway 2.

On the west side, access is less restricted. National Forest System or State lands border much of this portion of the roadless area. In the north, access can be gained by trails which begin at U.S. Highway 2. Roads paralleling Hungry Horse Reservoir provide access to the Swan Crest and other portions east of the South Fork Flathead River. Many other roads provide access to the west side; Holland Lake is the most popular of these. On the south side, the road near Monture Creek, North Fork Blackfoot River Road, Copper Creek Road, and Alice Creek Road provide access to this portion of the roadless area.

The topography and vegetation in the eastern portion differ dramatically from the western portion. These changes occur at the Continental Divide. On the east side, the topography was formed by overthrust faulting and local glaciation. Generally, the area is steep and dissected with numerous valleys. On the west side, the terrain is steep as a result of uplifting of the Swan Range along the Swan Fault. Glaciers have scoured the sides and tops of these mountains, leaving them well rounded on the top.

Major ecosystems on the east side (Kuchler, 1966*) are the western spruce-fir forest and the Douglas-fir forest, with alpine meadows and foothill prairie occurring in lesser amounts. Mountains are characterized by long linear ridges called reefs with forests or grasslands on the gentle backslopes and barren rock cliffs on the front of the thrust sheet. Major tree species on the east side are Douglas-fir, lodgepole pine, ponderosa pine, Engelmann spruce, and subalpine fir. The area is not densely forested and has low productivity, with south facing slopes often open or in a mosaic of forest and meadows that are a result of wildfire. Large grasslands (parks) occur in most major drainages. Major ecosystems on the west side are the western spruce-fir forest with some Douglas-fir forest and alpine meadow in the southern portion. Major tree species are Douglas-fir, larch, lodgepole pine, western white pine (in the north), Engelmann spruce, subalpine fir, and whitebark pine. The area is densely forested with trees thinning out to alpine meadows toward the higher elevations.

Precipitation varies from 20 to 40 inches or more per year on the east side; from 40 to 60 inches or more per year on the west side.

The roadless area provides habitat for many wildlife species, including grizzly bear, black bear, cougar, lynx, fisher, marten, elk, deer, whitetail deer, mule deer, wolf, moose, mountain goat, and bighorn sheep. Whitetail deer are found mostly on the west side, mule deer on the east. This roadless area, with most of the area at high elevations, contains important summer range habitat for big-game species.

The grizzly bear is a threatened species. The majority of the roadless area is considered occupied grizzly bear habitat and classified as Situation 1, or necessary for the survival and recovery of the grizzly bear. The gray wolf is classified as an endangered species. Sightings of gray wolf are rare. Potential habitat exists in the majority of the roadless area, but it is not currently considered to be occupied. The area also provides habitat for the threatened bald eagle and the peregrine falcon.

Significant fisheries include the Middle Fork Flathead River in the northern portion, and the Dearborn River in the southeast portion. The Middle Fork Flathead River contains important bull trout spawning areas. The Dearborn River is known for its excellent cutthroat trout fishing.

This roadless area has special importance to many people because it is adjacent to the Great Bear, Bob Marshall, and Scapegoat Wildernesses. Much of the use in these areas is either by horse or foot, and involves hiking, backpacking, hunting, cross-country skiing, and horseback riding. In order to get to one of the three wilderness areas, one usually travels several miles through this roadless area. Some people view parts of this roadless area as part of their wilderness experience in the Bob Marshall or Scapegoat Wildernesses. Two of the most popular access points to the Bob Marshall Wilderness, Holland Lake, and Benchmark, are in this roadless area.

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* Kuchler, A. W., 1966, Potential Natural Vegetation of the Conterminous United States. American Geographical Society, NY.

Livestock grazing, motorized recreation, timber harvesting, and oil and gas development represent other uses of this roadless area to other people. Most grazing occurs on the east side. Timber harvesting potential is not very high for the entire area because most of the area is high elevation, steep, and has low productivity sites. The better timber sites are on the west side. Probably the most important resource with the highest potential for development is the oil and gas resource. Much of this roadless area is over the overthrust belt. This area is rated as having a very high potential for oil and gas; much of it is leased.

To describe and analyze this roadless area in greater detail, twelve different locations are identified (see location map or Bear-Marshall-Scapegoat-Swan roadless area map in map package). The east side is considered part of the Rocky Mountain Front. From north to south, included are:

Badger/Two Medicine
Teton
Deep Creek/Reservoir North
Renshaw
Benchmark/Elk Creek
Silver King/Falls Creek

The eastern portion of this roadless area is managed by the Lewis and Clark and Helena National Forests.

On the west side, most of the roadless area is in the Swan Mountain Range. From north to south, included are:

Middle Fork Flathead
East South Fork Flathead
Swan Crest
Swan Front
Monture
Stonewall Mountain

The western portion is managed by the Lolo, Flathead, and Helena National Forests.

Badger/Two Medicine - This area consists of the Badger Creek and South Fork-Two Medicine River drainages. Badger Creek and its tributaries flow east. The Badger Creek drainage consists of steep, rocky mountains dissected by numerous narrow canyons and waterways. The South Fork of the Two Medicine River flows north towards Glacier National Park. Two Medicine is a broad, glaciated valley with moderate slopes.

Snowmobilers and motorcyclists are the predominate users of the area's transportation system. The Elk Calf-Two Medicine Trail is a National Recreation Trail.

These lands were once part of the Blackfoot Indian Reservation. This area was ceded from the reservation in 1896. The Blackfoot Indian Nation retains certain use rights on these lands under the Agreements of 1888 and 1896, and the Treaty of 1855. The Treaty and Agreements also accorded to the United States certain rights and privileges.

Teton - This area includes Blackleaf Canyon and the North, South, and Middle Forks of the Teton River. The Middle Fork Teton River and the eastern sides of several high peaks along the Teton-Sun River Divide are found here. The area borders the Bob Marshall Wilderness for 8 miles. Two heavily used trails, Route Creek, and Headquarters Pass, provide access to the Bob Marshall. This area consists of high rugged mountains formed by thrust faults with steep front slopes and gentle backslopes bisected by numerous valleys and streams.

The Blindhorse Creek Wilderness Study Area, managed by the Bureau of Land Management, and the Montana Department of Fish, Wildlife, and Parks' Blackleaf Game Range are located adjacent to this area.

The high peaks found along the divide are Rocky Mountain Peak, at 9,392', the highest mountain within the Bob Marshall Wilderness; Old Baldy, 9,156'; Teton Peak, 8,416'; and Mt. Lockhart, 8,691'. Mountain goats are found within the area. Our Lake, one of the few alpine lakes in the eastern portion, is heavily used by backpackers and fishermen.

Blacktail-South Fork Teton, Crown Mountain-Petty Creek, and Jones Creek are National Recreation Trails which pass through the area.

Deep Creek/Reservoir North - This area, which is 25 miles northwest of Choteau, is south of the Teton area. Deep Creek/Reservoir North borders the eastern side of the Bob Marshall Wilderness for 15 miles, and consists of high parallel overthrust limestone reefs separated by deep valleys. Sheep Reef, Arsenic Mountain, and other unnamed features separate Deep Creek from the Sun River drainage. Chute Mountain and Castle Reef along the eastern boundary rise abruptly from the adjacent prairie foothills. The extensive south facing valleys, such as Hannan, Blacktail, Mortimer, Big George, Wagner Basin, and Arsenic Mountain serve as winter habitat for elk, whitetail deer, mule deer, and bighorn sheep. Large numbers of elk use the southern portion of the area for seasonal migration and winter habitat. The area is the wintering range for the Sun River Rocky Mountain bighorn sheep herd, numbering around 1,000. This is one of the largest herds in the lower 48 states.

The southwestern portion of the area is used extensively by commercial outfitters and guides and private recreationists during the general hunting season. Visitor use in the area is light during the spring and summer and consists of day hiking, hoseback riding, and traffic enroute to the Bob Marshall Wilderness. Use increases dramatically during hunting season. A National Recreation Trail runs north/south through the area along Blacktail Creek and the South Fork of the Teton River. Two adjacent Bureau of Land Management Wilderness Study Areas, Chute Mountain and Deep Creek/Battle Creek, are found on the eastern boundary of this area.

Renshaw - This area is bordered on the north and west by the Bob Marshall and Scapegoat Wildernesses. It contains three distinct areas - Patricks Basin, which consists of Lange Creek draining north to Gibson Reservoir through a broad, heavily timbered valley; the plateau area, which consists of Fairview and Ford Creek Plateaus; and the South Fork of the Sun River. The Sun River elk herd, one of the largest in Montana, uses the Lange Creek drainage, along with the Bob Marshall and Scapegoat Wildernesses to the west and the Sun River Game Range to the east. The Fairview-Ford Creek Plateau provides winter habitat for bighorn sheep and elk. The third area, the valley of the South Fork of the Sun River, is a popular access route to the Bob Marshall Wilderness.

A small subalpine lake, Renshaw Lake, is frequented by fishermen and youth groups. Two major landmarks of this area are Renshaw Mountain, 8,264', and Fairview Mountain, 8,245', whose impressive eastern face is seen far out on the plains. Steep limestone reefs border the eastern boundary of the area, giving way to sharp peaks, high mountain grasslands, and trees to the west. Parts of the area were burned in the 1920's and are now large grasslands.

Benchmark/Elk Creek - This area is south of Benchmark and borders the Scapegoat Wilderness. Three mountains border its western edge: Patrol Mountain, at 8,031'; Crown Mountain, at 8,401'; and Steamboat, at 8,565'. The area consists of high rugged mountains formed by thrust faults with steep side slopes bisected by numerous valleys and streams. It contains occupied grizzly bear habitat. The Benchmark Road to the north of this area is the most popular access route to the Bob Marshall on the east side. Elk Creek Road is becoming a popular access point to the Scapegoat Wilderness. Patrol Mountain and Steamboat, both popular day hikes, provide spectacular views of the surrounding wilderness to the west and foothills prairie to the east.

Silver King/Falls Creek - This area is located about 20 miles southwest of Augusta and lies to the east of the Scapegoat Wilderness. It includes the Falls Creek drainage and the Dearborn River drainage east of the Scapegoat Wilderness, and also another Falls Creek drainage southwest of the Continental Divide. This area straddles the Continental Divide. Twin Buttes, Caribou Peak, Burned Point, and Steamboat Mountain are found here. Falls Creek drainage, which is dominated by Caribou Peak (8,773') high on the Continental Divide, is located in the area. Silver King Mountain, at 7,771', dominates the area south of the Continental Divide. The Dearborn River drainage consists of a steep-walled canyon with a scenic gorge in the Devil's Glenn area. The river itself is a series of rapids and deep pools which offer excellent cutthroat trout fishing. The Falls Creek drainage consists of the open, broad-valleyed east fork and the heavily timbered west fork. Both drainages have steep, rugged headwalls along the Continental Divide.

Middle Fork Flathead - This area, located in the northern portion of the Bear-Marshall-Scapegoat-Swan roadless area, contains steep to very steep terrain with broken and diverse country, especially the areas bordering the Great Bear Wilderness. It contains important grizzly bear habitat and travel corridors. Areas within 1/2 mile of the Middle Fork River have been designated as bald eagle habitat. A small mountain goat population inhabits Slippery Bill Mountain. Some important bull trout spawning area in the

Middle Fork drainage is located in portions of this roadless area. Challenge, Granite, Dodge, Morrison, and Puzzle Creeks are closed to fishing by the Montana Department of Fish, Wildlife, and Parks and designated as spawning streams.

Recreation use is light to moderate depending on the locale and access availability. The majority of the use in the area is by hunters, fishermen, snowmobilers, cross-country skiers, hikers, and people using stock to gain access into the Great Bear Wilderness. The Big Bill, Granite Creek, and Morrison Creek Trails are the major routes to the Great Bear Wilderness. Numerous smaller trails are used as access to lakes within the Great Bear Wilderness. They provide good day hike opportunities.

East South Fork Flathead - This area is located within the South Fork Flathead River drainage. It is bordered to the northeast by the Great Bear Wilderness and to the south by the Bob Marshall Wilderness. The area to the southwest is managed for timber with main access roads in the valley bottoms.

The area is moderately steep to steep, reaching from heavily timbered to subalpine land forms with scattered rock outcroppings. The higher elevations have shallow soils and are low in productivity. Some open ridges exist along the Great Bear Wilderness boundary. Hungry Horse Reservoir is the dominant feature seen from this area. Great Northern Mountain dominates the view to the east. Some extensive lodgepole pine stands regenerated from the 1929 Half Moon fire occur near Desert Mountain. Elk migrating out of the Middle Fork and a portion of the Bob Marshall Wilderness use part of this area as their migration route to and from winter habitat. The area also includes important spring grizzly bear habitat.

The major dispersed recreation use of this area is hiking or big-game (elk, deer, and bear) hunting. The Big Bill Trail which accesses the Great Bear Wilderness and the Spotted Bear Trail which accesses the Bob Marshall Wilderness are heavily used. Other access trails are available but receive little use. Outstanding views can be seen from the high ridges.

Extensive limestone caves are found in the southeast portion just north of Sargeant Mountain.

Swan Crest - This area extends from Badrock Canyon on the north to Sixmile Mountain on the south. The east side parallels the Hungry Horse Reservoir and borders on timber managed land. The area varies from 3 to 5 miles in width and is approximately 30 miles long. It is an extension of the Swan Front and is not adjacent to any designated wilderness.

A variety of scenes surround this roadless area. Directly to the east, Hungry Horse Reservoir and existing logging activities dominate the view. Past logging activities, parts of the Great Bear Wilderness, and Glacier National Park can be seen further to the east and northeast. To the west, the Flathead and Swan Valleys, the Whitefish Range, and the Mission Mountains Wilderness can be seen. The Jewel Basin Hiking Area is in the center of the area.

The terrain is steep as a result of uplifting that occurred when the Swan Range was formed along the Swan Fault. The break in topography in the Strawberry Lake area is a result of two cross-faults. Although the basin walls are steep, the east side of the divide is more gentle than the west slope. Elevation varies from 3,500' to over 7,500'.

The Jewel Basin Hiking Area is a specially designated back-country use area consisting of 15,349 acres of high mountains. It includes 28 alpine lakes, many picturesque mountain streams, meadows, rocky peaks, subalpine timber, and a variety of flowers. The Alpine Trail, which runs along the top of the Swan Divide, offers spectacular views of both the Flathead Valley and Hungry Horse Reservoir. Other trails and lakes outside the Jewel Basin are also special features. This area is easily accessed for day and weekend use. The Strawberry Lake area, just outside Jewel Basin, is also a popular day use area.

Major uses in the area include hunting, fishing, hiking, horseback riding, snowmobiling, and trail bike use. Most trail bike use occurs around Columbia Mountain.

Swan Front - This area extends from Sixmile Mountain south to Morrell Mountain. It is bounded on the east by the Bob Marshall Wilderness for approximately 2/3 of its length and by the South Fork of the Flathead River and Hungry Horse Reservoir to the northeast. The area involves the west facing slope of the Swan Range down to private land and presently roaded areas. It also includes the Bunker Creek-Sullivan Creek drainages.

A continuous chain of high, and often treeless, rugged mountains form the backbone of the Swan Front. Among the highest are Swan Peak (9,289'), Union Peak (8,825'), and Holland Peak (9,356'). Below the high peaks and ridges lie a series of alpine and subalpine basins or hanging valleys. Most of the lakes in this area are found here, several of which are stocked with fish. Below the high basins is an area that is often called the canyon zone. Here the streams of the Swan Front plunge down narrow bottoms between steep side slopes until they reach the gentler terrain of the Swan Valley. Rocks and cliffs prevail in much of the canyon zone. On the northern end, the east facing slopes are broken by major drainages with high ridges leading toward Hungry Horse Reservoir.

Grizzly use the area for summer habitat and winter denning sites. Important mountain goat habitat is also found here.

The major dispersed recreation use of this area is hiking, horseback riding, or big-game hunting. Gorge Creek Trail, Napa Point, Smith Creek, and Holland Lake Trails are major access points to the Bob Marshall Wilderness. The Holland Lake Trail is the most used trail into the Bob Marshall Wilderness. Several outfitters operate within the Hall-Trinkus Lake and Lion Creek areas. The Alpine Trail passes through this area from north to south along the crest of the Swan Range, ending at Inspiration Point. Here it enters the Bob Marshall Wilderness and ties to the Gorge Creek Trail. A variety of outstanding views can be seen from the Swan Divide.

Several falls are found in Bond, Lion, Condon, Rumble, Morrell, and Holland Creeks. Best known is Holland Falls. The trails to Holland Falls and Morrell Falls are popular National Recreation Trails. In the Lion Creek Canyon is a mature cedar grove. Lion Creek passes through the grove in a series of cascades and falls.

The Swan Front is considered to be an important part of the Swan Valley watershed. Likewise, the Bunker and Sullivan Creek drainages are considered important to the water quality of the South Fork of the Flathead River.

Monture - This area is adjacent to the Bob Marshall Wilderness on the north and the Scapegoat Wilderness on the east side. Terrain ranges from steep barren mountain slopes to heavily timbered valleys. Elevations range from 4,600' to 8,700'. Monahan Mountain, Morrell Mountain, and Fenn Mountain rise above 8,000', along with numerous other mountains which border along the two adjacent wildernesses. Approximately 60 percent of the area is forested. The remainder of the area is evenly divided between a mosaic of forest, shrubs, and rockland. Cirque basins, tarn lakes, U-shaped valleys, and serrated ridges caused by alpine glaciation can be seen at the head of the Monture Creek drainage. All of the major streams drain into the Blackfoot River.

Fisheries are good in the area, with Monture Creek and the North Fork Blackfoot River the main fishable streams. Lake Otatsy, Canyon Lake, and Camp Lake are fishable lakes. Monture is also critical for wildlife. It contains important grizzly bear habitat as well as elk migratory routes between the Bob Marshall Wilderness and the Blackfoot-Clearwater Game Range.

Portions of the area receive heavy use, especially around some of the lakes and entrances to the Bob Marshall Wilderness. Use includes backpacking, horseback riding, and hunting. Several outfitter base camps are located here. During the summer and fall, outfitters use the trails in the valleys to access the Bob Marshall and Scapegoat Wildernesses. A few trails receive light levels of trailbike and snowmobile use.

Stonewall Mountain - This area is situated along the southern boundary of the Scapegoat Wilderness. Topography varies widely within the area, from rolling mountains in the Alice Creek portion to more rugged mountain peaks, cliffs, avalanche paths, and tallus slopes in the rest of the area. Glacial cirque basins and steep glaciated valleys occur in all portions of the area except for Alice Creek. Most of the area west of Stonewall Mountain and Copper Creek is very steep and rocky. The area east of Stonewall Mountain to Copper Creek is steep and well timbered on north facing slopes. It contains open growing stands of timber with small grassland parks on south and west facing slopes. The Alice Creek drainage is a moderately steep area. Elevations range from 4,900' in the Blackfoot Valley to 9,411' on Red Mountain. Red Mountain is the highest peak for this part of the Rockies south of Glacier National Park. Numerous peaks are over 7,500' in elevation.

A unique vegetative community exists on the southeast slopes of Red Mountain consisting of both whitebark and limber pine. These two species are growing together at an elevation of about 8,000'. This area has been recommended for a 4,000 acre Research Natural Area by the Intermountain Experiment Station.

Fisheries are very good in the area. Arrastra Creek and Landers Fork of the Blackfoot River are the main fishable streams. Copper Lakes and Silver King Lake (mostly on private land) are the only fishable lakes. Cutthroat trout is the principle species in both streams and lakes.

Recreation use consists mainly of hunting, with hiking and horseback riding also popular. Snowmobilers use the Stonewall Mountain Trail to travel to the Upper Copper Creek Basin and use the Alice Creek/Lewis and Clark Pass area. Most of the drainage bottoms have access trails with the Reservoir Lake Trail in Arrastra Creek receiving the most use. Fishermen regularly visit Copper Lake.

B. CAPABILITY

1. WILDERNESS ATTRIBUTES

The Bear-Marshall-Scapegoat-Swan surrounds the Bob Marshall, Scapegoat, Great Bear Wilderness Complex. It contains 866,330 acres with all but 1,152 acres in National Forest System land. It has had some disruption in natural integrity and natural appearance. Human activities in some of the area are evident, although most impacts are concentrated along road corridors and the exterior boundaries. In other areas the only disruptions are trails which access the Bob Marshall, Scapegoat, or Great Bear Wildernesses.

Most of the plant and animal species that existed in this roadless area when the Lewis and Clark Expedition passed south of here nearly 200 years ago are still present. Most mammal species present then are still present now; however, some are considered threatened or endangered. The integrity of the fisheries has been altered by the stocking of grayling and rainbow trout. Rainbow trout hybridizes readily with the native cutthroat trout. Many miles of unaltered cutthroat streams remain. Some plant species, such as spotted knapweed, leafy spurge, thistle, and clover have been introduced accidentally into the area through livestock use. These species are found mainly along the trails. Off trail, the plant community has changed little except for successional changes and those brought about by naturally occurring fires. To the untrained eye, the natural appearance of this area is high.

In general, the Bear-Marshall-Scapegoat-Swan roadless area possesses high opportunities for solitude because of its size and the influence of the adjacent Bob Marshall, Scapegoat, and Great Bear Wildernesses. Much of it contains highly dissected topography that easily screens people from one another in a short distance. Some portions are influenced by adjacent roads and other developments.

The area offers high opportunities for primitive recreation. A variety of topography challenges the visitor with its high mountain tops and steep valleys. The large size of the area offers the opportunity to get away from the man-influenced environment and experience excellent primitive recreation activities such as fishing, camping, hunting, backpacking, hiking, and horseback riding.

Other features include a high diversity of wildlife and wildlife habitat; spectacular views; unique geographical features and vegetation; an extensive trail system; outstanding hunting; important, high quality watersheds; and a specially designated hiking area. Wildlife species include all the major game species. The Sun River elk and bighorn sheep herds (some of the largest in Montana) migrate through the eastern portions of this roadless area. The entire area contains essential habitat for the threatened grizzly bear and endangered gray wolf. Views of Glacier National Park; the Bob Marshall, Scapegoat, Great Bear, and Mission Mountain Wildernesses; and the surrounding prairies and valleys can be seen from many of the peaks and ridges in this area. Limestone caves are found near the South Fork Flathead River and a unique cedar grove exists in the Lion Creek drainage in the Swan Front. Many miles of National Recreation Trails have been designated here. People nationwide are attracted by the outstanding hunting and backcountry experiences here and in the adjacent wildernesses. The area contains important watersheds for the Sun River, Dearborn River, Swan River, and the South Fork Flathead River. The heavily used Jewel Basin Hiking Area is located in this roadless area.

2. MANAGEABILITY AND BOUNDARIES

Because this area surrounds the Bob Marshall, Scapegoat, Great Bear Wilderness Complex, it consists of several long narrow segments which are usually separated by road corridors. The boundary along the adjacent Bob Marshall, Scapegoat, and Great Bear Wildernesses are usually well defined by high ridges and major topographic features. Other boundaries parallel existing roads or land survey lines which are sometimes difficult to identify.

In 1977 the Forest Service inventoried 758,454 acres in the Bear-Marshall-Scapegoat-Swan Roadless Area for RARE II. Currently, the inventory contains 865,178 acres. The following chart displays how the inventory changed.

From this inventory, the Bear-Marshall-Scapegoat-Swan roadless area was combined into 12 areas instead of 18. The 18 areas were based on administrative boundaries and divided the A1485 roadless portion into noncontiguous areas. The 12 areas listed below are based on geographic differences only.

RARE II #	RARE II Name	National Forest	Net Acres	Change In Acreage	Reason for Change	Revised Net Acres
A1485	Bear-Marshall-Scapegoat-Swan	Flathead	176,479	-8,939 60,350	Timber sales and roads. Addition of Unit Plan roadless acres.	227,890
A1485	Bear-Marshall-Scapegoat-Swan	Helena	54,700	-2,580 -635	Timber sales and roads. Acreage recalculation.	51,485
A1485	Bear-Marshall-Scapegoat-Swan	Lewis & Clark	219,775	-1,600 9,828	Timber sales and roads. Addition of acres released from Great Bear Wilderness Study.	228,003
A1485	Bear-Marshall-Scapegoat-Swan	Lolo	14,596	-2,290	Acreage recalculation.	12,306
B1485	Bear-Marshall-Scapegoat-Swan	Lolo	18,474	152	Acreage recalculation.	18,626
B1485	Bear-Marshall-Scapegoat-Swan	Lolo	3,800	25	Acreage recalculation.	3,825
E1485	South Fork Willow Creek	Lewis & Clark	1,732			1,732
F1485	Silver King/Falls Creek	Helena	6,300	915	Acreage recalculation.	7,215
F1485	Silver King/Falls Creek	Lewis & Clark	32,000			32,000
H1485	Deep Creek	Lewis & Clark	15,770			15,770
N1485	Reservoir South	Lewis & Clark	1,751			1,751
P1485	Reservoir North	Lewis & Clark	26,068			26,068
Q1485	Clearwater-Monture	Lolo	66,945	2,113 -1,275	Manageable boundary acreage recalculations. Acreage recalculation.	67,783
S1485	Swan	Flathead	70,400	-1,831 31,680 20,811	Timber sales and roads. Addition of Unit Plan roadless acres. Boundary adjustment to meet roadless criteria.	121,060
T1485	Leavitt Creek	Lewis & Clark	2,400			2,400
U1485	Packbridge	Lewis & Clark	3,255			3,255
W1485	Renshaw	Lewis & Clark	25,649			25,649
Z1485	Dunham Point	Lolo	18,360			18,360
		TOTAL	758,454	106,724		865,178

ID	ROADLESS AREA	NATIONAL FOREST	NET ACRES	GROSS ACRES
C1485	Badger/Two Medicine	Lewis & Clark	102,100	102,100
T1485	Teton	Lewis & Clark	63,133	63,133
P1485	Deep Creek/Reservoir North	Lewis & Clark	45,922	45,962
W1485	Renshaw	Lewis & Clark	57,591	57,611
A1485	Benchmark/Elk Creek	Lewis & Clark	32,314	32,314
F1485	Silver King/Falls Creek	Lewis & Clark	35,568	35,568
F1485	Silver King/Falls Creek	Helena	7,215	7,215
MF485	Middle Fork Flathead	Flathead	42,450	42,450
ES485	East South Fork Flathead	Flathead	57,640	57,640
SC485	Swan Crest	Flathead	106,870	106,870
SF485	Swan Front	Flathead	141,990	141,990
SF485	Swan Front	Lolo	20,840	21,540
Q1485	Monture	Lolo	100,060	100,400
A1485	Stonewall Mountain	Helena	51,485	51,537
	TOTAL		865,178	866,330

In the Rocky Mountain Front, adjacent to National Forest System lands, are three roadless areas being studied for their wilderness potential by the Bureau of Land Management. The three areas are: Blindhorse Creek, Chute Mountain, and Deep Creek/Battle Creek. These areas comprise 11,218 acres and are adjacent to the Teton and Deep Creek/Reservoir North portions of the Bear-Marshall-Scapegoat-Swan roadless area. They have been recommended for Outstanding Natural Area designation in the Headwaters Final Environmental Impact Statement published by the Bureau of Land Management's Butte District in November 1983. Management of these areas emphasizes roadless management and scenic values.

In discussions between the Bureau of Land Management and Forest Service, it was agreed that the two agencies would consider complementary management alternatives for their adjacent lands and that coordinated recommendations be submitted to Congress. The range of alternatives in the Bureau of Land Management Final Environmental Impact Statement are within the range of alternatives in this study.

Current uses which may not conform with wilderness management include oil and gas leasing. Of the 865,178 acres, 718,481 acres have been leased.

3. HIGHLIGHTS OF WILDERNESS ATTRIBUTES AND WILDERNESS MANAGEABILITY FOR INDIVIDUAL AREAS

Wilderness suitability of the individual areas in the Bear-Marshall-Scapegoat-Swan area are now discussed beginning with the areas east of the Continental Divide.

Badger/Two Medicine - The Badger/Two Medicine area is a contiguous parcel of National Forest System land. Boundaries are well defined by existing wildernesses, major terrain features, and the Forest boundary. An old road system and present motorized use would make wilderness management difficult.

Human activity in this area has left extensive impacts. A primitive road system, resulting from seismic activity during the late 1950's and early 1960's, is located within the area. Although much of the system is now designated for administrative purposes and trail vehicles, snowmobilers and motorcyclists use this system. Human activity is evident although most impacts are concentrated along roads and the exterior boundaries.

The area is large enough and the topography such that persons visiting the area feel they are in a natural area, away from ordinary human activity and development. Old seismic roads and motorized use distract from the natural appearance of the area.

In the southeast Two Medicine valley, opportunities for primitive recreation and solitude are high. Natural integrity and apparent naturalness have been impacted by the extensive unimproved road system, trail oriented use, and livestock grazing. In the Badger Creek drainage, opportunities for solitude and primitive recreation are very high. Apparent naturalness and natural integrity have been impacted by seismic roads, but these impacts can be easily excluded by boundary adjustments.

The Badger/Two Medicine roadless area is within the area that was once part of the Blackfoot Indian Reservation. The Treaty of 1855 and Agreements of 1888 and 1896 between the Blackfoot Indian Nation and the United States established for members of the Blackfoot Indian Nation certain use rights on these lands. The Agreement of 1896 specifically provides to the Blackfoot Tribe the following:

> "Provided, that said Indians shall have, and do hereby reserve to themselves, the right to go upon any portion of the lands hereby conveyed so long as the same shall remain public lands of the United States, and to cut and remove therefrom wood and timber for Agency and school purposes, and for their personal uses for houses, fences, and all other domestic purposes: and provided further, that the said Indians hereby reserve and retain the right to hunt said lands and to fish in the streams thereof so long as the same shall remain public lands of the United States under and in accordance with the provisions of the game and fish laws of the State of Montana."

These treaty rights place a lien on the land which is incompatible with wilderness classification or would make management of wilderness and these uses very difficult. This was borne out by Congress in the passage of PL-94-557 requiring the Great Bear Wilderness Study. The original bill (S.392) included 20,000 acres of treaty rights area; however, the 20,000 acres were removed by Congress from the Great Bear Study Area before passage of the final law.

Oil and gas leases have been granted for this entire area with some restrictions on occupancy. Seismic activity in recent years has been extensive and oil and gas potential is very high. These leases grant the operator a reasonable opportunity to explore for and develop oil and gas resources. Leases grant preexisting rights that could reduce natural integrity and appearance and would make wilderness management difficult.

Teton - This area is a contiguous parcel of National Forest System land. Boundaries along the western and northern edge of this area are well defined along topographic features of the adjacent Bob Marshall Wilderness. The eastern boundary is defined along the Forest boundary and by road corridors which intrude into the area and are difficult to identify.

The Teton area consists of three units. The North Fork Teton drainage offers moderate opportunity for solitude and high opportunities for primitive recreation. Natural integrity and apparent naturalness are impacted by trail oriented use, livestock grazing, and seismic roads along Blackleaf Creek. Opportunities for boundary adjustments to exclude man's activities are limited because the North Fork Teton Road traverses the entire drainage. The Middle Fork Teton drainage offers high opportunities for solitude and primitive recreation. Natural integrity and apparent naturalness are impacted by trail use. The South Fork is similar to the North Fork in wilderness attributes. Opportunities for solitude are only moderate due to heavy recreational use at Our Lake and Headquarters Pass. The headwaters of the South Fork and Middle Fork drainages, which form the spectacular Teton Peaks, would rate very high in all the wilderness attributes.

The Teton River area is separated by two major road corridors. The southeast roads provide access which would help in administration, but decrease the wilderness attributes.

Oil and gas leases have been granted for this entire area with some restrictions on occupancy. Seismic activity in recent years has been extensive and oil and gas potential is very high. These leases grant the operator a reasonable opportunity to explore for and develop oil and gas resources. Leases grant preexisting rights that could reduce natural integrity and appearance and would make wilderness management difficult.

Deep Creek/Reservoir North - Deep Creek/Reservoir North is a sizable, compact unit. Boundaries are fairly well definable on major terrain features or proclaimed Forest boundaries. In a few locations, terrain features are less prominent and boundaries will be difficult to locate on the ground.

Deep Creek/Reservoir North shows some disruption of natural integrity and apparent naturalness. Opportunities for solitude and primitive recreation are high.

Human activity impacted some drainages. The area contains two roads (constructed in the 1960's for seismic exploration) and two recreation residences. The roads are located in Hannan Gulch and Deep Creek, but can be excluded by major boundary adjustments. The recreation residences are scheduled for termination by 1992.

Deep Creek/Reservoir North possesses opportunities for solitude because of its large size and topographic relief. The area offers a variety of topography to challenge the visitor with its narrow valley bottoms, rolling hills, and high mountain peaks. There are excellent recreation opportunities such as hunting, scenic viewing, hiking, and horseback riding in primitive recreation settings.

There are some opportunities to modify the boundary. The north/south and east/west ridgetops provide several alternative locations. The size of the area would be greater than 30,000 acres. Boundary adjustments to reduce conflict with possible oil and gas activities would reduce the area to about 10,000 acres.

This area has been designated a Wilderness Study Area. It has been leased for oil and gas with restrictions on occupancy and only permits exploratory drilling and not production of oil and gas. This leasing decision was based on the need to acquire more information on the area's oil and gas resources. These leases will expire in 1991 if no discoveries are made. Once the oil and gas potential of the area is determined, a recommendation regarding wilderness will be made through an amendment or revision of the Lewis and Clark National Forest Plan.

Renshaw - The Renshaw area is a contiguous parcel of National Forest System lands. It is a long, narrow unit. Boundaries are defined by existing wildernesses and major and minor terrain features.

This area consists of three basic units. Patricks Basin (Lange Creek) is a broad, forested drainage that offers high opportunities for solitude and primitive recreation. Natural integrity and apparent naturalness are high and man's activities and influence are not apparent. The South Fork Sun River unit is a large valley with extensive use by recreationists. Opportunities for solitude are moderate because of large numbers of recreationists traveling through the area to the adjacent Bob Marshall Wilderness. Natural integrity and apparent naturalness are high, with most influences resulting from trail oriented use and use along the river. The Plateau area consists of large open hillsides and timbered riparian areas. Opportunities for primitive recreation and solitude are high. Apparent naturalness and natural integrity have been impacted by livestock grazing. Driveways, drift fences, and watershed protection fences are located throughout the area and detract from apparent naturalness.

The area offers a variety of topography to challenge the visitor with its high mountain tops and broad plateaus. The large size of the area offers the opportunity to get away from the man-influenced environment and experience excellent primitive recreation activities.

Benchmark/Elk Creek - The Benchmark/Elk Creek area is a long narrow unit. The western boundary is defined by the high ridges and major topographic features along the Scapegoat Wilderness. The eastern boundary parallels the Benchmark Road and the Forest boundary. This boundary is difficult to identify.

The Benchmark/Elk Creek area has had some disruption in natural integrity and natural appearance. Solitude and primitive recreation opportunities are high because of its size and the influence of the adjacent Bob Marshall and Scapegoat Wildernesses. Much of the area contains highly dissected topography that easily screens people from one another in a short distance. Some areas are influenced by adjacent roads and other developments.

Human activity in the area is evident although most impacts are concentrated along roads and the exterior boundaries. Human activity and influences in the area include timber cutting along the Beaver-Willow and Benchmark Roads.

Seismic activity in recent years has been extensive and oil and gas potential is very high. Oil and gas leases have been granted for this entire area with restrictions on occupancy. These leases grant the operator a reasonable opportunity to explore for and develop oil and gas resources. Leases grant pre-existing rights that could reduce natural integrity, appearance, and would make wilderness management difficult.

Silver King/Falls Creek - The Silver King/Falls Creek area is a contiguous parcel of National Forest System lands. The area is a compact unit with boundaries well defined by existing wildernesses, major terrain features, and on proclaimed Forest boundaries. The eastern boundary is very difficult to define and identify on the ground. Vegetation management and range use in some areas may be a wilderness management problem. The area has had little disruption in natural integrity, natural appearance, and solitude. Solitude and primitive recreation opportunities are high because of its size and the influence of the adjacent Scapegoat Wilderness.

The Dearborn Canyon in the Devil's Glenn area offers very high opportunities for primitive recreation and provides high opportunities for solitude. Natural integrity and apparent naturalness are impacted only by an old logging road constructed in the 1920's that is used as a trail along the Dearborn River. Some livestock grazing also occurs in the lower portions of the canyon. The Falls Creek area consists of the East and West Forks of Falls Creek. The East Fork is open and lightly forested and offers moderate opportunities for solitude and primitive recreation. Natural integrity and apparent naturalness have been impacted by trail oriented use and domestic livestock grazing and range improvements. The West Fork of Falls Creek is heavily timbered and offers high opportunities for solitude and primitive recreation. Trail oriented use and limited livestock grazing in the lower reaches of the drainage have impacted apparent naturalness and natural integrity. Another Falls Creek drainage, south of the Continental Divide, is very remote and offers high opportunities for solitude and primitive recreation.

Middle Fork Flathead - West of the Continental Divide, the natural integrity and appearance of the Middle Fork Flathead portion remains high. Maintained trails which access the Great Bear Wilderness detract from the area's natural integrity. Other impacts on the natural integrity of this roadless area are the television antenna site and an old 4-wheel-drive trail located on Mule Ridge. Noise from the railroad and Highway 2 along the Middle Fork River detracts from the naturalness of the area.

Opportunities for solitude are few due to the off-site intrusion of noise from the highway and railroad along the Middle Fork River. Heavy use in the area during certain times of the year, especially hunting season, makes it hard to get away from other users.

Opportunities for primitive recreation are present in this area but lessened due to the evidence of past activities in the adjacent areas. The winter climate and steep terrain provide opportunities for challenging recreation activities.

Portions of this area were studied during the Great Bear Wilderness Study and not recommended for wilderness. This area may be difficult to manage due to boundaries which parallel existing roads that were built to access timber harvest activities.

East South Fork Flathead - The natural integrity of this area is high except for several trails and a mining claim in the Silver Basin area. The area has retained its natural appearance due to the difficulty of access. The natural appearance is impacted somewhat by the activities along the Hungry Horse Reservoir.

Opportunities for solitude are limited due to the close proximity of timber management and main access roads used by fishermen, campers, outfitters, as well as by administrative traffic. Except in some of the hidden basins, man's activities can usually be seen or heard throughout most the area.

Primitive recreation includes big-game hunting or hiking in steep and rugged terrain.

Portions of this area were studied during the Great Bear Wilderness Study and not recommended for wilderness.

Swan Crest - The natural integrity of the Swan Crest is very high except for the existing trails and the scars of skid trails used to haul materials to the electronic site near Jewel Basin. The Jewel Basin Hiking Area includes six pit toilets and several fire pits. Being the closest roadless area to population centers in the Flathead Valley, this area receives heavy use. It is impacted only slightly by the developments in the area. The view of man's activities within the Flathead Valley or east along Hungry Horse Reservoir do not detract from the natural appearance of the area itself. There is presently one special use electronic site on the Divide overlooking Jewel Basin which is quite evident to users of Jewel Basin.

Opportunities for solitude exist on the major portion of this roadless area but may be compromised due to the proximity to timber management access roads. The area is narrow with projecting fingers of unroaded land providing limited opportunity for solitude. The area does have good topographic screening in some areas and good vegetative screening near Columbia Mountain.

Opportunities for primitive recreation in the form of hiking, cross-country skiing, fishing, or hunting are present in this area. Hiking to the high alpine lakes can offer a challenging experience to some people, especially to those lakes not accessed by trails. Because this roadless area is located at higher elevations, drastic weather changes can offer the hiker and camper a wide range of experiences. The abundance of lakes along the Swan Crest is a major attraction to the area.

Boundaries along the east side of this area follow roads and existing timber harvest units. Large, continuous areas do exist, especially in the Columbia Mountain/Lake Blaine area to the north. Much of the area consists of high elevation lands with boundaries following old harvest activity areas which make it difficult to manage.

Swan Front - The Swan Front's natural appearance has been altered only along the established trails cutting through to the Bob Marshall Wilderness. Generally, the natural integrity of this area is still very high.

Due to the narrowness of the area at some points, natural appearance is low when a visitor is near off-site logging activities or along major access trails. An administrative cabin and a snow course are located near Upper Holland Lake; also, an old lookout shelter exists on the main ridge just to the north of Thunderbolt Mountain, and a cabin exists on the Divide near Trinkus Lake.

Opportunity for isolation from the sights and sounds of man and his activities are high in this area. Some areas, such as Lion Creek, Lost Creek, Upper Holland Lake Basin, and Squeezer Creek, provide some outstanding chances for solitude.

The steep and rugged terrain, along with drastic weather changes, can offer the visitor a challenging experience in mountaineering. The views from the Swan Divide into the Bob Marshall Wilderness and across the Swan Valley to the Mission Mountain Wilderness are spectacular.

The area around Napa Point and south to the Swan Peak area is notable due to the glacial activity that has occurred, and is still occurring.

The western boundary of this area is delineated by past harvest practices and private ownership. The northeastern boundary winds its way up and down drainages following roads and existing timber harvest units. The remaining eastern boundary, adjacent to the Bob Marshall Wilderness, is easily defined by the crest of the Swan Range.

Monture - The Monture area is relatively free of external influences. Natural integrity and appearance are high. A few past management activities impact the area. These activities include logging and roading of an area near Coopers Lake, two patented mining claims in West Fork Lake Creek, several trapper cabins, and a radio repeater on Lake Mountain. Overall, these activities have had very little impact on the natural appearance of the area.

There is an outstanding opportunity for solitude due to high topographic screening, dense vegetative screening, and the large size of the area. The adjacent wildernesses add significantly to the area's value for solitude as well as primitive recreation and wildlife. In the southeast portion, background views of logging, ranching, and U.S. Highway 200 may affect the feeling of solitude.

Primitive recreation opportunities are outstanding due to very diverse terrain and many challenging situations for the visitor. The unit is also in close proximity to the Clearwater Valley chain of lakes which is a popular recreation area.

The Monture portion is basically linearly shaped. It will add almost 50 miles of boundary crossing 33 travel routes (16 trails, 1 road, and 16 streams and ridges). About half the boundary is on prominent topographic features. Much of the remaining boundary traverses broken terrain. Many sectors (about 23 miles) are point-to-point directions. A 5-mile sector in Monture Creek is defined as 300 feet back from the trail. About 7 1/2 miles in Lake Creek and McDermott Creek are defined by contour lines. Potential for nonconforming vehicle use is mostly limited to the trail access points; cross-country vehicle travel is seldom practical. Motorcycles use the trails in the Lake Creek-Lake Otosky area. Although defining the boundary would be relatively difficult, controlling motorized use should be relatively easy.

Stonewall Mountain - The impact from human activity is evident in some places. In the past, and more recently (the 1960's), some hardrock mining exploration has occurred. These areas are located in the Cotter Basin, Copper Camp, Alice Creek, and Stonewall Creek areas. Most of this activity lies on the fringes of the area. There are old roads associated with these activities. The area with the largest impact is Bear Creek in the Alice Creek drainage. Most roads are still driveable but only with off road vehicles. Evidence of past earth moving activity is present in all these areas. Some clearcuts are in the Alice Creek, Beaver Creek, and Arrastra Creek drainages. These logging units are on the edge of the roadless area. Silver King Lookout is the only Forest Service maintained structure in the area. One special use cabin is in the Alice Creek drainage, as well as fences used for controlling livestock. Seismic exploration has occurred here in recent years.

The area is large enough and the topography is such that any person visiting the area would gain the feeling that they are in a natural area free from human activities and development. The high peaks afford the viewer with vistas of part of the Scapegoat Wilderness mountain ranges to the south and many of the major drainages in the district. Some distant roads and timber harvesting areas can be seen from these high points.

This area possesses very high opportunities for solitude. Screening of the more developed areas occurs over most of the area. Sounds of vehicles, chainsaws, and logging activity are screened from most of the area due to the topography and lay of the terrain.

The area offers a variety of topographic features to challenge the visitor. The high peaks, steep slopes, flat valley bottoms, and numerous streams, offer a different primitive recreation experience to visitors.

This area is also noted for other features. Red Mountain is the highest peak from Lincoln to Glacier National Park, rising 9,411' above sea level. It is one of the few sites in the United States where limber pine and whitebark pine grow together.

The Lewis and Clark Trail passes up Alice Creek over Lewis and Clark Pass. This is of historical interest to many Forest users.

The area also supports a small herd of Rocky Mountain goats near Red Mountain.

C. AVAILABILITY

1. RESOURCE POTENTIALS

See Resource Summary Tables.

The discussion that follows refers to resources present within this roadless area other than the previously discussed wilderness resource.

The Resource Summary Table displays a summary of the different resources for the Bear-Marshall-Scapegoat-Swan roadless area and each of its portions.

All of the area offers high opportunity for primitive recreation.

Currently, a total of 7,713 AUM's are produced on 35,620 acres of suitable range. Most cattle and sheep grazing occurs on the east side. Some of the grazing is by recreational pack stock.

Of the 864,000 acres in the Bear-Marshall-Scapegoat-Swan, 276,000 acres are classified as tentatively suitable. Timber opportunities are much greater on the west side than on the east. Less than 20 percent of the land on the east side is classified as tentatively suitable as opposed to over 42 percent on the west side. The east side usually contains "pockets" of commercial timber (mostly spruce and lodgepole pine) in drainages on north facing slopes. On the west side the area is much

RESOURCE SUMMARY TABLES

	Gross Acres	Net Acres	Recreation - Current Use (RVD's/Year) Primitive	Semiprimitive Nonmotorized	Semiprimitive Motorized	Roaded Natural
TOTAL	866,330	865,178	7,600	162,950	136,650	5,240
Badger/Two Medicine	102,100	102,100	0	3,600	11,200	700
Teton	63,133	63,133	0	18,000	56,300	500
Deep Creek/Reservoir North	45,962	45,922	0	2,900	1,500	300
Renshaw	57,611	57,591	200	0	2,150	0
Benchmark/Elk Creek	32,314	32,314	0	9,200	28,900	300
Silver King/Falls Creek	42,783	42,783	100	250	2,300	20
Middle Fork Flathead	42,450	42,450	0	800	500	20
East South Fork Flathead	57,640	57,640	400	1,300	300	400
Swan Crest	106,870	106,870	2,600	11,300	1,400	2,300
Swan Front	163,530	162,830	1,900	20,600	5,800	700
Monture	100,400	100,060	0	95,000	25,000	0
Stonewall Mountain	51,537	51,485	2,400	0	1,300	0

	Range Suitable Acres	AUM's	Timber Suitable Acres	Standing Volume	Max. Potential Yield-MMBF/Yr.
TOTAL	35,620	7,713	275,608	1,629.1	43.80
Badger/Two Medicine	4,594	1,092	16,136	53.0	1.94
Teton	6,754	1,100	6,278	29.7	.75
Deep Creek/Reservoir North	3,160	615	4,575	36.5	.55
Renshaw	10,460	2,735	15,870	118.1	1.90
Benchmark/Elk Creek	2,854	1,109	10,925	79.9	1.31
Silver King/Falls Creek	1,567	644	11,929	89.2	1.43
Middle Fork Flathead	0	0	16,910	100.5	3.92
East South Fork Flathead	0	0	22,700	179.2	5.27
Swan Crest	610	0	33,120	305.5	7.68
Swan Front	0	0	44,303	297.1	8.40
Monture	800	64	59,304	157.9	4.78
Stonewall Mountain	4,821	354	33,558	182.5	5.87

RESOURCE SUMMARY TABLES

	Fisheries		Lakes			Grizzly Situation	
	Stream Miles	Stream Habitat	Number	Acres	Water Developments	1	2
TOTAL	329.5	769.3	53	898.7	1	755,059	83,561
Badger/Two Medicine	43.9	160.0	0	0	0	102,100	0
Teton	18.1	43.9	1	14.0	0	63,133	0
Deep Creek/Reservoir North	13.6	33.0	0	0	0	45,922	0
Renshaw	17.8	32.4	1	5.0	0	57,591	0
Benchmark/Elk Creek	6.0	14.6	0	0	0	32,314	0
Silver King/Falls Creek	95.5	283.5	0	0	0	42,783	0
Middle Fork Flathead	18.5	15.7	1	18.3	0	42,450	0
East South Fork Flathead	20.0	56.8	2	21.0	0	50,140	7,500
Swan Crest	12.0	18.8	22	540.5	0	73,050	33,820
Swan Front	17.5	9.1	9	157.8	1	157,710	0
Monture	38.6	37.5	10	47.1	0	79,926	0
Stonewall Mountain	28.0	64.0	7	95.0	0	7,940	42,241

	Big Game Winter Range	Minerals				
		Very High	High	Moderate	Low	Claims
TOTAL	44,405	0	3,677	84,525	778,901	153
Badger/Two Medicine	6,407	0	0	0	102,100	0
Teton	5,993	0	0	0	63,133	0
Deep Creek/Reservoir North	4,530	0	0	0	45,922	0
Renshaw	6,292	0	0	0	57,591	0
Benchmark/Elk Creek	1,230	0	0	0	32,314	0
Silver King/Falls Creek	556	0	0	3,200	42,760	0
Middle Fork Flathead	0	0	0	0	42,450	0
East South Fork Flathead	7,600	0	0	57,640	0	37
Swan Crest	3,960	0	0	0	106,870	0
Swan Front	2,880	0	0	0	162,830	0
Monture	1,103	0	2,177	23,045	74,838	0
Stonewall Mountain	3,854	0	1,500	640	48,093	116

RESOURCE SUMMARY TABLES

	Oil and Gas					
	Potential				# of Leases	Area Leased
	Very High	High	Moderate	Low		
TOTAL	353,312	511,866	0	0	481	718,481
Badger/Two Medicine	102,100	0	0	0	42	102,100
Teton	63,133	0	0	0	43	62,957
Deep Creek/Reservoir North	45,922	0	0	0	19	41,838
Renshaw	57,591	0	0	0	17	26,287
Benchmark/Elk Creek	32,314	0	0	0	19	30,314
Silver King/Falls Creek	42,783	0	0	0	0	0
Middle Fork Flathead	0	42,450	0	0	42	42,450
East South Fork Flathead	0	57,640	0	0	58	57,640
Swan Crest	0	106,870	0	0	67	104,230
Swan Front	0	162,830	0	0	93	155,940
Monture	0	100,060	0	0	49	46,450
Stonewall Mountain	9,469	42,016	0	0	32	48,275

more heavily forested, on more productive sites and on lower slopes. The total potential yield for the area is 44 MMBF/year, with 82 percent from the west side. This is the maximum yield if every tentatively suitable acre was scheduled for timber management.

Most of the area is classified as Management Situation 1 for the grizzly bear. This roadless area is part of the Northern Continental Divide Ecosystem. The population for grizzly bears is estimated to be 440 to 680 bears for this ecosystem. About 15 percent of the occupied habitat in this ecosystem is found here. This area also provides habitat for the gray wolf.

The diversity and abundance of wildlife, both game and nongame species, is an important resource for this roadless area. Some habitat improvement can be done to increase wildlife populations. This is especially true on the east side, where 25,000 acres of winter range exist. Improving winter range, which is considered the limiting factor for big-game species, would improve the habitat for many species, especially elk and deer.

Hardrock potential is generally moderate or low, although in the Stonewall Mountain area some portions are rated high.

The potential for oil and gas is rated very high on the east side and high on the west side. The entire roadless area is part of the Overthrust Belt, a zone that is currently considered as having some of the highest oil and gas potential in the Rocky Mountain region. The unique combination of source and reservoir rocks and favorable orientation of trapping rocks may allow for accumulation of large amounts of oil and gas. Opportunity for oil and gas exploration and development is generally in valley bottoms and side slopes. Occupancy opportunities are limited in certain areas by no-surface occupancy and limited use stipulations.

Of particular interest on the east side are the Teton, Deep Creek/Reservoir North, Renshaw, and Silver King/Falls Creek areas. All these areas have been leased except for the RARE II recommended wilderness portions in Renshaw and Silver King/Falls Creek. An active drill site in Blackleaf Canyon in the Teton portion indicates that productive source reservoir rocks are adjacent to these areas.

On the west side, all the roadless area has been leased except for the RARE II recommended wilderness portion in the Monture area. The Swan Crest, Swan Front, and the Monture areas have had seismic surveys recently, although presently no drill sites are active here.

The following is a summary of significant resource potentials and important management considerations of individual portions of the Bear-Marshall-Scapegoat-Swan roadless area.

Badger/Two Medicine - Cattle use most of this area. In one allotment, sheep grazing is scheduled to be phased out because of possible conflicts with grizzly bears.

Water from Birch Creek is impounded for irrigation use into Swift Reservoir to the southeast of the roadless area. This project is being studied for possible hydro power production.

The Upper Two Medicine Valley is suitable for timber management activities. Other areas are marginal or contain a large percentage of noncommercial forest land.

Fire burned portions of the area between 1889 and 1910. Part of the area was burned in the Hungry Man Creek Fire in 1941. Although large fires occurred in the area, the number of fires occurring annually is low. Natural vegetation succession is replacing many open/grassland areas with trees and shrubs. This encroachment is beginning to limit the amount of forage and browse production for wildlife and livestock. These trends are expected to continue.

Teton - Nine developed sites such as the Teton Pass Ski Area and Waldon Creek Snowmobile Parking Area, plus many special use permit recreation residents and resorts are immediately adjacent to the area. These provide "jump-off" points for most of the recreation activity in the area.

As in the Badger/Two Medicine portion, shrub encroachment limits forage and browse production for livestock.

Deep Creek/Reservoir North - This area is very lightly forested, with only about 10 percent classified as commercial forest land.

Big-game winter habitat is found at lower elevations throughout the area. Big George Gulch and Hannan Gulch/Wagner Basin provide major opportunities for wildlife habitat improvement through burning.

The RARE II study concluded that even though Deep Creek/Reservoir North rated very high in wilderness attributes, a rational decision as to whether or not wilderness classification is in the National interest could not be made until the oil and gas resources of the area are determined. The oil and gas leases include 34,664 acres of no-surface occupancy. Approximately 25,000 acres have timing restrictions to protect big-game concentration areas. The leases contain the "Further Planning Stipulation" which allows for exploration but no production or field development until a decision on wilderness classification is made. A suit has been filed in U.S. District Court to review these leases.

Access to the area along the eastern boundary would be a problem as no right-of-ways exist.

Renshaw - Approximately 28 percent of the area is classified as commercial forest land. Very little of the Renshaw area is suitable for timber management activities. Most areas are marginal or contain a large percentage of noncommercial forest land.

Watersheds within the Renshaw, Deep Creek/Reservoir North, and Teton areas are characterized by steep slopes, shallow soils, and sparse vegetative cover. This combination severely limits the on-site storage capacity with rapid runoffs frequently resulting in floods. Major floods were in 1894, 1906, 1916, 1927, 1938, 1948, 1953, 1964, and 1975.

Portions of these areas provide water to several reservoirs. Water from these reservoirs irrigate approximately 233,000 acres of land in north central Montana each year. Gibson and Diversion Dams in the Sun Canyon are potential hydro power producers.

Benchmark/Elk Creek and Silver King/Falls Creek - These areas have very little land suitable for timber management activities. Most areas are marginal or contain a large percentge of noncommercial forest land.

Water from the Dearborn River is diverted for irrigation just outside the Forest boundary.

Middle Fork Flathead - In this area, improvements are possible for bull trout spawning habitat.

Timber harvesting is possible in some portions of the area, but logging methods would be expensive and, in most cases, would not be considered economical. The mountain pine beetle and the spruce bark beetle are major problems within the area. Because of the large amounts of fuel buildups caused by insects and diseases, and because of varied wind conditions, most of the area is considered high risk to fire.

East South Fork Flathead - The stands of timber consist of smaller trees and, for the most part, less desirable species. Timber harvesting is possible in some portions of the area but logging methods would be expensive. The mountain pine beetle, the Douglas-fir bark beetle, and the spruce bark beetle are currently the major problems in the area. Root rots are also affecting some species of trees.

Swan Crest - Along the lower slopes, wildlife populations may be increased through wildlife habitat improvement. The upper basins and alpine areas are good habitat for grizzly and black bears.

Several productive sites within this roadless area consist of stands of timber which could be harvested in the future, especially those stands on the west side facing Hungry Horse Reservoir. Road building and harvest systems will be expensive in most of these areas.

The spruce bark beetle is currently active in some of the higher basins. The Douglas-fir bark beetle is also affecting some of the Douglas-fir in the lower areas. Certain root rots can also be found on some sites.

Swan Front - Timber resources are limited, as is site suitability. Minor or no timber values exist in the high elevations and moderate to good timber values exist on lower slopes and valley floors. Road building and harvest systems will be expensive in most of these areas.

This unit contains the headwaters that form numerous major fish spawning streams flowing into the South Fork of the Flathead River. Sullivan Creek, which flows into Hungry Horse Reservoir, and Bunker Creek are the two major streams. A few small lakes form the headwaters but in most cases the lakes found in this unit are sinkholes resulting from glacial action.

Monture - In this area, the timber potential is greater than in other portions of the Bear-Marshall-Scapegoat-Swan roadless area. About 1/3 of this area can be managed cost efficiently for timber management.

All the Monture area is leased for oil and gas except for the RARE II recommended wilderness areas.

Stonewall Mountain - Most of this area has low timber production potential because of high elevation, rocky terrain, and severe climate; however, there are some areas with moderate timber production potential located in the valley bottoms.

D NEED

1. PROXIMITY TO OTHER DESIGNATED WILDERNESSES

Nearby wilderness areas and distances from population centers are given in Table C-1, Parts A and B. Wilderness use has risen rapidly through the 1970's; wilderness use is projected to continue to rise, although not as rapidly, in the next few decades. Recreation use projections for the surrounding National Forests show that in the next few decades Forests will be unable to meet the quantity of use demanded for wilderness recreation with the existing wilderness designation.

The Bear-Marshall-Scapegoat-Swan roadless area is currently not a heavily used area, with the exception of the Swan Crest which receives heavy day use from Kalispell. From a National view point, the adjacent wildernesses (Bob Marshall, Scapegoat, and Great Bear) are not heavily used. According to estimates in 1983, the Bob Marshall ranked fourteenth in the Nation and second in Montana (behind the Absaroka-Beartooth Wilderness) in recreation visitor days. This is probably due to the remoteness and the fact that the Bob Marshall Complex receives very little or no day use. Nonetheless, the Bob Marshall Complex, which has been called the "Crown Jewel" of the National Wilderness Preservation System, remains a very popular place to visit for people from all parts of the country.

2. CONTRIBUTION TO NATIONAL WILDERNESS PRESERVATION SYSTEM

Nearly all habitat types found in this roadless area are also found in the adjacent Bob Marshall, Scapegoat, and Great Bear Wildernesses. In some cases habitat types would be enhanced by the addition of portions of the roadless areas. For example, the cedar grove in the Lion Creek area of the Swan Front would add to the western red cedar/queencup beadlily habitat type which is found only as an ecotone in the Bob Marshall Wilderness. The high elevation Fairview and Ford Creek

Plateaus in the Renshaw area are also excellent examples of mountain grassland habitat types. Plateaus with these habitat types are not found in any of the adjacent wildernesses. Also, a unique vegetative community exists on the southeast slopes of Red Mountain in the Stonewall Mountain area. Both whitebark pine and limber pine grow in the same area at an elevation of 8,000'.

This roadless area contains essential habitat for the grizzly bear and the gray wolf. Most of the habitat has been classified as Situation 1 for the grizzly bear. Activities in Situation 1 habitat must maintain or benefit the grizzly bear.

The wildlife in the eastern portion of this roadless area is unique. It is one of the few places in the country where elk, bighorn sheep, and deer are found in high densities and in adjacent habitats. The bighorn sheep herd which uses the Deep Creek/Reservoir North and Renshaw areas is one of the largest in the country.

3. PUBLIC INVOLVEMENT

The Bear-Marshall-Scapegoat-Swan roadless area and the Bob Marshall Wilderness Complex, which includes the Great Bear, Bob Marshall, and Scapegoat Wildernesses, have had controversial pasts. Originally, most of the area that was later to become the Bob Marshall Wilderness was set aside in the early 1930's in three primitive areas - the South Fork, Pentagon, and Sun River. Establishment of these primitive areas received wide, general public support. A 31,000 acre strip of National Forest System land was not included in the original Pentagon Primitive Area because of the possibility of constructing a road connecting Spotted Bear on the South Fork of the Flathead across the Continental Divide to Benchmark on the Sun River. This area, following considerable controversy and discussion, was added to the Pentagon Primitive Area in 1939. In 1940, the Bob Marshall Wilderness area was created by combining and reclassifying the three existing primitive areas.

In 1954, the Forest Service proposed harvesting the heavily insect infested timber in the Bunker Creek drainage. This included some areas presently in the Swan Front portion of the Bear-Marshall-Scapegoat-Swan roadless area. The Flathead Lake Wildlife Association opposed this action and, with support from outside groups, presented a petition to the Secretary of Agriculture requesting that 279,000 acres of roadless National Forest System land between the northern boundary of the wilderness and near the southern boundary of Glacier National Park, including the Bunker Creek drainage, be added to the Bob Marshall Wilderness. The Forest Service, at that time, determined that the area would better serve the needs of the Nation if it were not managed as wilderness. Several groups, including the Rocky Mountain Sportsmen of Columbia Falls, the Kalispell Chamber of Commerce, and the Flathead County Commissioners, were in favor of the Forest Service Plan, however, late in 1954 salvage plans and road plans were dropped.

Other groups wished to extend the southern boundary of the Bob Marshall Wilderness to include another 50,000 acres of roadless area on the North Fork of the Blackfoot River. A memorandum to Congress from the Montana Legislature asking for this extension was unsuccessful.

Roading and timber harvesting began in the Middle Fork Flathead River area in the 1960's. In 1964, the Wilderness Act was passed, formally designating the Bob Marshall a unit of the National Wilderness Preservation System. A Coordinated Resource Management Study was instigated in 1969 which resulted in a moratorium on timber harvest activities in the Middle Fork Flathead River area. In 1971, the Forest Service's Roadless Areas Review and Evaluation (RARE I) selected this area, along with other areas north of the Bob Marshall Wilderness, as new Wilderness Study Areas. Congress directed, however, that these areas were to be studied for wilderness under the Omnibus Wilderness Act of 1976. The Great Bear Wilderness was designated as wilderness in 1978 as a result of this study. Many people supported wilderness classification. Most of the controversy was over the proposed boundaries and power transmission corridor. Lands not designated as wilderness have been included in this roadless evaluation.

Also, in the 1950's, controversy over the management of the area known as the Lincoln Backcountry began. This area had never been classified as a primitive area and had not been managed for wilderness purposes by the Forest Service. Consequently, the area had not been subject to wilderness review procedures. Any proposed plans to develop the area were rejected by the public. In 1972, the Scapegoat Wilderness was established.

Past public involvement in 1979 for RARE II showed varying amounts of support for wilderness designation of the different portions of the Bear-Marshall-Scapegoat-Swan roadless area. Public response for all the portions showed no moderate or strong support for either wilderness or nonwilderness designation; response was generally split.

The final recommendation from RARE II designated 140,349 acres to wilderness, 41,838 to further planning, and 513,365 to nonwilderness. Areas recommended for nonwilderness were Renshaw (31,304 acres), Silver King/Falls Creek (38,300 acres), south end of the Swan Front (3,800 acres), and Monture (66,945 acres). Deep Creek/Reservoir North (41,838 acres) was recommended for further planning and all other acres were recommended for nonwilderness.

In the summer and autumn of 1983, the public was again asked to comment on the portions of the Bear-Marshall-Scapegoat-Swan roadless area. Again, response was generally split. Areas receiving the most interest for wilderness designation were the upper part of the Swan Crest, the Swan Front, Monture, Silver King/Falls Creek, Renshaw, Deep Creek/Reservoir North, and the western part of the Teton area. This proposal, commonly called Alternative "W", involves boundary adjustments in many of the areas to lessen management conflicts. Of particular interest is Deep Creek/Reservoir North which conservation groups have declared as one of the first places to protect as part of the Nation's wilderness heritage.

Support for wilderness classification has been mixed. Local landowners and residents adjacent to the area have expressed strong support for managing the area to retain its present characteristics and uses. This group has expressed desire for a much smaller area of wilderness to be added to the Bob Marshall than Alternative "W". This would include a portion of Deep Creek/Reservoir North and the Lange Creek and South Fork Sun River portion of Renshaw.

Many people who do not support wilderness advocate road closures for wildlife if an area is roaded; others want to see the area open to most uses. Oil and gas interests support nonwilderness status until the oil and gas potential of the area is determined. Timber interests also support nonwilderness status for this roadless area. Even though boundaries may be adjusted so that very little commercial timber may be involved in a wilderness recommendation, they feel more land designated as wilderness would increase pressure on commercial forest lands to meet wildlife or other nontimber targets.

The Governor's wilderness recommendation for the State of Montana proposed 294,440 acres as wilderness in this roadless area. This included: 15,360 acres, Swan Crest; 64,000 acres, Swan Front; 39,040 acres, Teton; 42,240 acres, Silver King/Falls Creek; 40,320 acres, Deep Creek/Reservoir North; 36,480 acres, Renshaw; and 57,000 acres, Monture. The completion of certain ecosystems partially represented by existing wilderness areas was a key aspect of this recommendation of which the most notable among these is the Bob Marshall Complex. This recommendation also emphasized restoring big game habitat "of the Sun River and Rocky Mountain Front."

Public comments were again received in the spring and summer of 1985 on this roadless area when the four Forests published the roadless area analysis in the Supplemental and draft EIS's. The Bear-Marshall-Scapegoat-Swan roadless area was one of the most commented on areas of all the roadless areas analyzed for wilderness suitability. Very few responses were concerned with the roadless area in its entirety; instead, most people commented on specific areas that they were familiar with, with many of these areas being the same areas in Alternative "W". On the east side of this roadless area, many people wanted these unroaded lands added to the National Wilderness Preservation System. High wilderness quality and a desire to protect the area from development were stated. Several respondents felt wilderness values outweighed any possible economic return. Other respondents felt that the grizzly bear, other wildlife, and recreation values would be better protected under wilderness classification. One respondent stated that there is no guideline in the Wilderness Act stipulating that oil and gas potential should eliminate an area from wilderness consideration. Many reviewers identified specific areas they felt should be classified as wilderness, such as Renshaw and Silver King/Falls Creek. Other respondents felt that the careful nonwilderness management of the areas would protect these areas as well as provide the opportunity to explore for oil and gas resources and provide for diverse recreational opportunities. On the west side, many people commented on the Swan Crest, Swan Front, and the Monture areas. Most people agreed on the Forest Service recommendation for the Swan Front and the Monture areas. The Swan Crest also received strong wilderness support; however, some people were concerned wilderness classification would reduce motorized recreation opportunities. Also some people were concerned that the Jewel Basin Hiking area would be opened to horse use if wilderness classification included this area. Elimination of horse use in the hiking area was controversial and continues to be so.

E. ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

1. MANAGEMENT PRESCRIPTION ASSIGNMENTS BY ALTERNATIVE

The Bear-Marshall-Scapegoat-Swan roadless area is managed by four National Forests - the Lewis and Clark, Flathead, Lolo, and Helena. In formulating alternatives for this roadless area, 12 alternatives were developed which correspond to the Forest Plan alternatives from each Forest. The following is a brief discussion of each alternative.

Alternative I - This alternative designates all the inventoried roadless area to wilderness, except for the Badger/Two Medicine area and the Deep Creek/Reservoir North area (see discussion under II. Capability for reasons for not recommending wilderness for these two areas).

Alternative II (Current Direction) - This alternative is the current direction of managing the roadless area. The portion of the roadless area designated as wilderness would follow the RARE II recommendation (16 percent of the area).

Alternative III - This alternative emphasizes the development of the roadless area. Only a minimal amount is designated as wilderness.

Alternative IV (Preferred Alternative) - This alternative is the combination of the Forests' Preferred Alternatives. Approximately 25 percent of the roadless area is recommended for wilderness. Total forest outputs are at the level of the Preferred Alternative.

Alternative V - This alternative emphasizes the amenity values of the Forest. The Forest is not intensively managed for commodity outputs. Approximately 42 percent of the roadless area is managed for wilderness.

Alternative VI - This alternative emphasizes a moderate to high level of Forest outputs with 42 percent of the roadless area managed for wilderness.

Alternative VII - This alternative emphasizes a moderate to high level of outputs with 31 percent of the roadless area managed for wilderness.

Alternative VIII - This alternative emphasizes a moderate to high level of outputs with 57 percent of the roadless area managed for wilderness.

Alternative IX - This alternative emphasizes a moderate to high level of outputs with 67 percent of the roadless area managed for wilderness.

Alternative X - This alternative emphasizes intensive management of the Forests' resources. The portion of the roadless area managed for wilderness follows the RARE II recommendation. The portion not recommended for wilderness is developed for other uses.

Alternative XI - This alternative emphasizes the RARE II recommendation with limited development in the portion of the roadless area not recommended for wilderness management. The forest is managed at a moderate intensity.

Alternative XII - This alternative emphasizes the RARE II recommendation with low or no development in the portion of the roadless area not recommended for wilderness management. The forest is managed at a low intensity for commodity values.

The following table displays the crosswalk of each Forest Plan alternative with the roadless area alternative. For example, Alternative IV (Preferred) for this roadless area corresponds to Alternative 11 in the Flathead National Forest Plan alternatives; Alternative G for the Lewis and Clark; Alternative D for the Lolo; and Alternative E for the Helena. Each Forest studied their portion of this roadless area in the Forest Plan alternatives. The roadless area alternatives (I through XII) combine Forest Plan alternatives with the same emphasis so that this area may be studied in its entirety.

Crosswalk of Forest Alternatives

Bear-Marshall Scapegoat-Swan	Flathead	Lewis & Clark	Lolo	Helena
I	9	H	g	J
II (Current Direction)	2,7	Current Plan	a	A
III	4,6	J	e	C
IV (Preferred)	17	G	d	E
V	10	I	b	G
VI	14	I	d	G
VII	11,12,13	G	c	G
VIII	15	K	d	F
IX	16	H	f	F
X	6,4	A,B	c	B
XI	8,3	D,F	d	D
XII	1,5	C,E	b	H

Designation of Bear-Marshall-Scapegoat-Swan Roadless Area by Alternative

Management Emphasis*	ALTERNATIVES I	 II (Current Dir)	 III	 IV (Preferred)	 V	 VI
Wilderness	717,156	139,769	29,505	219,164	367,012	366,915
Wilderness Study	41,838	41,838	41,838	41,838	41,838	41,838
Roadless	84,321	369,349	546,666	399,878	291,202	269,149
Wildlife/Range	21,863	59,883	76,495	73,069	68,960	72,948
Timber Without Roads	0	4,430	24,889	21,541	4,637	16,196
Timber With Roads	0	249,909	145,785	109,688	91,529	98,132
TOTAL	865,178	865,178	865,178	865,178	865,178	865,178

Summary of Management Emphasis:

	Decade	I	II	III	IV	V	VI
Roaded	1	0	29,846	33,483	25,293	12,570	25,663
	5	7,600	331,454	212,335	167,140	99,303	128,883
Roadless	1	148,022	695,563	802,190	620,721	485,596	472,600
	5	140,422	393,955	623,338	478,874	398,863	369,380
Wilderness		717,156	139,769	29,505	219,164	367,012	366,915

	ALTERNATIVES VII	 VIII	 IX	 X	 XI	 XII
Wilderness	266,561	492,871	583,149	139,769	139,769	139,769
Wilderness Study	41,838	41,838	41,838	41,838	41,838	41,838
Roadless	360,799	196,140	143,831	424,250	464,758	455,283
Wildlife/Range	64,826	36,770	69,852	81,723	79,206	197,318
Timber Without Roads	16,186	15,716	124	3,578	26,230	431
Timber With Roads	114,968	81,843	26,384	174,020	113,377	30,539
TOTAL	865,178	865,178	865,178	865,178	865,178	865,178

Summary of Management Emphasis:

	Decade	VII	VIII	IX	X	XI	XII
Roaded	1	23,858	14,930	10,100	33,483	25,933	12,650
	5	162,828	99,313	39,757	288,986	206,386	50,411
Roadless	1	574,759	357,377	271,929	691,926	699,476	712,759
	5	435,789	272,994	242,272	436,423	519,023	674,998
Wilderness		266,561	492,871	583,149	139,769	139,769	139,769

* Mineral resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. See Section V, Part B, Management Prescription - Roadless, of this roadless area writeup for further discussion.

ALTERNATIVE I

	Wilderness	Wilderness Study	Roadless	Wildlife/ Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	80,674	21,426	0	0	102,100
Teton	63,133	0	0	0	0	0	63,133
Deep Creek/Reservoir North	0	41,838	3,647	437	0	0	45,922
Renshaw	57,591	0	0	0	0	0	57,591
Benchmark/Elk Creek	32,314	0	0	0	0	0	32,314
Silver King/Falls Creek	42,783	0	0	0	0	0	42,783
Middle Fork Flathead	42,450	0	0	0	0	0	42,450
East South Fork Flathead	57,640	0	0	0	0	0	57,640
Swan Crest	106,870	0	0	0	0	0	106,870
Swan Front	162,830	0	0	0	0	0	162,830
Monture	100,060	0	0	0	0	0	100,060
Stonewall Mountain	51,485	0	0	0	0	0	51,485
TOTAL	717,156	41,838	84,321	21,863	0	0	865,178

ALTERNATIVE II (Current Direction)

	Wilderness	Wilderness Study	Roadless	Wildlife/ Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	83,022	13,330	0	5,748	102,100
Teton	0	0	44,170	13,386	0	5,577	63,133
Deep Creek/Reservoir North	0	41,838	3,263	821	0	0	45,922
Renshaw	31,304	0	18,169	5,752	0	2,366	57,591
Benchmark/Elk Creek	0	0	22,462	6,979	0	2,873	32,314
Silver King/Falls Creek	39,215	0	2,410	821	0	337	39,215
Middle Fork Flathead	0	0	10,072	0	0	32,378	42,450
East South Fork Flathead	0	0	26,360	330	3,390	27,560	57,640
Swan Crest	0	0	52,925	0	0	53,945	106,870
Swan Front	3,690	0	93,217	2,653	1,040	62,230	162,830
Monture	65,560	0	6,328	5,339	0	22,833	100,060
Stonewall Mountain	0	0	6,951	10,472	0	34,062	51,485
TOTAL	139,769	41,838	369,349	59,883	4,430	249,909	865,178

ALTERNATIVE III

	Wilder-ness	Wilder-ness Study	Road-less	Wild-life/ Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	85,466	13,460	3,174	0	102,100
Teton	0	0	46,318	13,865	0	2,950	63,133
Deep Creek/Reservoir North	0	41,838	3,261	823	0	0	45,922
Renshaw	21,880	0	28,572	5,882	0	1,257	57,591
Benchmark/Elk Creek	0	0	23,653	7,143	0	1,518	32,314
Silver King/Falls Creek	7,625	0	27,087	2,357	0	5,714	42,783
Middle Fork Flathead	0	0	26,958	457	6,293	8,742	42,450
East South Fork Flathead	0	0	33,842	738	2,533	20,527	57,640
Swan Crest	0	0	68,530	0	1,089	37,251	106,870
Swan Front	0	0	112,470	2,390	11,800	36,170	162,830
Monture	0	0	69,996	11,339	0	18,725	100,060
Stonewall Mountain	0	0	20,513	18,041	0	12,931	51,485
TOTAL	29,505	41,838	546,666	76,495	24,889	145,785	865,178

ALTERNATIVE IV (Preferred)

	Wilder-ness	Wilder-ness Study	Road-less	Wild-life/ Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	89,372	12,728	0	0	102,100
Teton	10,870	0	38,416	12,810	0	1,037	63,133
Deep Creek/Reservoir North	0	41,838	3,461	623	0	0	45,922
Renshaw	19,144	0	32,016	5,435	0	996	57,591
Benchmark/Elk Creek	3,630	0	21,551	6,599	0	534	32,314
Silver King/Falls Creek	18,190	0	23,970	623	0	0	42,783
Middle Fork Flathead	6,295	0	26,728	167	2,462	6,798	42,450
East South Fork Flathead	5,187	0	24,965	660	3,133	23,695	57,640
Swan Crest	31,783	0	37,608	1,396	9,490	26,593	106,870
Swan Front	58,505	0	59,078	6,893	6,456	31,898	162,830
Monture	65,560	0	17,222	5,462	0	11,816	100,060
Stonewall Mountain	0	0	25,491	19,673	0	6,321	51,485
TOTAL	219,164	41,838	399,878	73,069	21,541	109,688	865,178

ALTERNATIVE V

	Wilderness	Wilderness Study	Roadless	Wildlife/Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	68,429	25,100	0	8,571	102,100
Teton	39,845	0	17,175	5,042	0	1,071	63,133
Deep Creek/Reservoir North	0	41,838	3,402	682	0	0	45,922
Renshaw	45,864	0	4,239	5,711	0	1,777	57,591
Benchmark/Elk Creek	26,027	0	940	4,078	0	1,269	32,314
Silver King/Falls Creek	42,783	0	0	0	0	0	42,783
Middle Fork Flathead	0	0	32,143	343	2,827	7,137	42,450
East South Fork Flathead	0	0	37,295	602	0	19,743	57,640
Swan Crest	60,826	0	22,707	0	1,810	21,527	106,870
Swan Front	86,107	0	49,945	1,218	0	25,560	162,830
Monture	65,560	0	29,183	2,451	0	2,866	100,060
Stonewall Mountain	0	0	25,744	23,733	0	2,008	51,485
TOTAL	367,012	41,838	291,202	68,960	4,637	91,529	865,178

ALTERNATIVE VI

	Wilderness	Wilderness Study	Roadless	Wildlife/Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	68,429	25,100	0	8,571	102,100
Teton	39,845	0	17,175	5,042	0	1,071	63,133
Deep Creek/Reservoir North	0	41,838	3,402	682	0	0	45,922
Renshaw	45,864	0	4,239	5,711	0	1,777	57,591
Benchmark/Elk Creek	26,027	0	940	4,078	0	1,269	32,314
Silver King/Falls Creek	42,783	0	0	0	0	0	42,783
Middle Fork Flathead	0	0	32,933	167	3,402	5,948	42,450
East South Fork Flathead	0	0	33,794	258	1,393	22,195	57,640
Swan Crest	60,826	0	20,839	0	5,608	19,597	106,870
Swan Front	86,010	0	44,432	2,715	5,793	23,880	162,830
Monture	65,560	0	17,222	5,462	0	11,816	100,060
Stonewall Mountain	0	0	25,744	23,733	0	2,008	51,485
TOTAL	366,915	41,838	269,149	72,948	16,196	98,132	865,178

ALTERNATIVE VII

	Wilderness	Wilderness Study	Roadless	Wildlife/ Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	84,845	12,728	0	4,527	102,100
Teton	5,040	0	41,134	12,810	0	4,149	63,133
Deep Creek/Reservoir North	0	41,838	3,461	623	0	0	45,922
Renshaw	19,144	0	31,253	5,435	0	1,759	57,591
Benchmark/Elk Creek	3,630	0	19,948	6,599	0	2,137	32,314
Silver King/Falls Creek	26,245	0	15,915	623	0	0	42,783
Middle Fork Flathead	0	0	32,933	167	3,402	5,948	42,450
East South Fork Flathead	0	0	33,794	258	1,393	22,195	57,640
Swan Crest	60,826	0	20,839	0	5,608	19,597	106,870
Swan Front	86,116	0	40,830	614	5,783	29,487	162,830
Monture	65,560	0	10,103	1,236	0	23,161	100,060
Stonewall Mountain	0	0	25,744	23,733	0	2,008	51,485
TOTAL	266,561	41,838	360,799	64,826	16,186	114,968	865,178

ALTERNATIVE VIII

	Wilderness	Wilderness Study	Roadless	Wildlife/ Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	69,824	28,022	0	4,254	102,100
Teton	63,133	0	0	0	0	0	63,133
Deep Creek/Reservoir North	0	41,838	3,513	571	0	0	45,922
Renshaw	57,591	0	0	0	0	0	57,591
Benchmark/Elk Creek	32,314	0	0	0	0	0	32,314
Silver King/Falls Creek	42,783	0	0	0	0	0	42,783
Middle Fork Flathead	8,839	0	24,909	0	3,443	5,259	42,450
East South Fork Flathead	24,220	0	15,467	0	882	17,071	57,640
Swan Crest	60,826	0	20,839	0	5,608	19,597	106,870
Swan Front	86,120	0	44,366	2,715	5,783	23,846	162,830
Monture	65,560	0	17,222	5,462	0	11,816	100,060
Stonewall Mountain	51,485	0	0	0	0	0	51,485
TOTAL	492,871	41,838	196,140	36,770	15,716	81,843	865,178

ALTERNATIVE IX

	Wilderness	Wilderness Study	Roadless	Wildlife/Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	80,674	21,426	0	0	102,100
Teton	63,133	0	0	0	0	0	63,133
Deep Creek/Reservoir North	0	41,838	3,647	437	0	0	45,922
Renshaw	57,591	0	0	0	0	0	57,591
Benchmark/Elk Creek	32,314	0	0	0	0	0	32,314
Silver King/Falls Creek	42,783	0	0	0	0	0	42,783
Middle Fork Flathead	34,746	0	6,989	0	0	715	42,450
East South Fork Flathead	57,640	0	0	0	0	0	57,640
Swan Crest	60,826	0	24,415	15,276	0	6,353	106,870
Swan Front	115,102	0	13,166	27,402	124	7,036	162,830
Monture	67,529	0	14,940	5,311	0	12,280	100,060
Stonewall Mountain	51,485	0	0	0	0	0	51,485
TOTAL	583,149	41,838	143,831	69,852	124	26,384	865,178

ALTERNATIVE X

	Wilderness	Wilderness Study	Roadless	Wildlife/Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	79,547	19,687	0	2,866	102,100
Teton	0	0	40,907	19,446	0	2,780	63,133
Deep Creek/Reservoir North	0	41,838	3,198	886	0	0	45,922
Renshaw	31,304	0	16,808	8,299	0	1,180	57,591
Benchmark/Elk Creek	0	0	20,804	10,077	0	1,433	32,314
Silver King/Falls Creek	39,215	0	2,514	886	0	168	42,783
Middle Fork Flathead	0	0	25,476	0	409	16,565	42,450
East South Fork Flathead	0	0	38,060	0	830	18,750	57,640
Swan Crest	0	0	68,530	0	1,089	37,251	106,870
Swan Front	3,690	0	102,162	614	1,250	55,114	162,830
Monture	65,560	0	10,103	1,236	0	23,161	100,060
Stonewall Mountain	0	0	16,141	20,592	0	14,752	51,485
TOTAL	139,769	41,838	424,250	81,723	3,578	174,020	865,178

ALTERNATIVE XI

	Wilderness	Wilderness Study	Roadless	Wildlife/ Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	87,380	12,265	0	2,455	102,100
Teton	0	0	48,216	12,536	0	2,381	63,133
Deep Creek/Reservoir North	0	41,838	3,364	720	0	0	45,922
Renshaw	31,304	0	19,958	5,306	0	1,023	57,591
Benchmark/Elk Creek	0	0	24,630	6,458	0	1,226	32,314
Silver King/Falls Creek	39,215	0	2,702	722	0	144	42,783
Middle Fork Flathead	0	0	32,933	167	3,402	5,948	42,450
East South	0	0	33,794	258	1,393	22,195	57,640
Swan Crest	0	0	65,582	1,396	13,759	26,133	106,870
Swan Front	3,690	0	107,659	15,738	7,676	28,067	162,830
Monture	65,560	0	17,222	5,462	0	11,816	100,060
Stonewall Mountain	0	0	21,318	18,178	0	11,989	51,485
TOTAL	139,769	41,838	464,758	79,206	26,230	113,377	865,178

ALTERNATIVE XII

	Wilderness	Wilderness Study	Roadless	Wildlife/ Range	Timber W/Out Roads	Timber With Roads	Total
Badger/Two Medicine	0	0	82,860	19,240	0	0	102,100
Teton	0	0	43,395	19,738	0	0	63,133
Deep Creek/Reservoir North	0	41,838	2,964	1,120	0	0	45,922
Renshaw	31,304	0	17,924	8,363	0	0	57,591
Benchmark/Elk Creek	0	0	22,159	10,155	0	0	32,314
Silver King/Falls Creek	39,215	0	3,348	220	0	0	42,783
Middle Fork Flathead	0	0	39,365	150	0	2,935	42,450
East South Fork Flathead	0	0	48,280	3,260	220	5,880	57,640
Swan Crest	0	0	70,728	26,207	0	9,935	106,870
Swan Front	3,690	0	73,760	82,124	211	3,045	162,830
Monture	65,560	0	29,183	2,451	0	2,866	100,060
Stonewall Mountain	0	0	21,317	24,290	0	5,878	51,485
TOTAL	139,769	41,838	455,283	197,318	431	30,539	865,178

2. IMPACTS

Each of the four Forests had many different management prescriptions applied to this roadless area in various alternatives. These management prescriptions were grouped into six different management emphases. This grouping is based on how the wilderness attributes (natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation) are affected by each management emphasis. The six emphases are listed below.

Wilderness - Includes wilderness management.

Wilderness Study - Includes management activities which preserve the roadless resource until a recommendation can be made for wilderness.

Roadless - Includes management activities where the intent is to preserve the roadless resource. Some roading may occur due to development of subsurface resources, such as oil and gas. Management prescriptions include Wild and Scenic River management, Jewel Basin Hiking Area management, dispersed recreation management, and minimum level management.

Wildlife/Range - Includes management activities where investments are made for wildlife or range management. Management activities, such as prescribed burning, watering tanks, and fencing would be evident. Some unscheduled roading may occur. Management prescriptions include wildlife management, grizzly bear management, and range management.

Timber Without Roads - Includes management activities where timber may be removed with aerial logging systems. No road construction would occur, although road construction may occur in adjacent areas. This managment prescription is only found west of the Continental Divide for this roadless area.

Timber With Roads - Includes management activities where roads and timber removal are scheduled. Timber management may not be the only intent of the prescription; wildlife management prescriptions may involve timber harvesting but with constraints. Management prescriptions include timber management, timber/wildlife management, riparian timber management, mule deer and elk management, and whitetail deer management.

e. Designation: Wilderness
Management Prescription: Wilderness

Alternatives I through XII examine a wide range of management options. Alternative I recommends nearly all (83 percent) of the roadless area to wilderness. Alternatives II through IX designate varying amounts of the roadless area to wilderness. Alternatives X through XII examine nonwilderness management options with wilderness designations following RARE II recommendations. Wilderness would preserve or enhance wilderness attributes. Current uses involving motorized recreation, trail maintenance, wildlife habitat improvement, and other uses or facilities not compatible with wilderness management would be eliminated. Timber harvest would not be permitted.

Current oil and gas leases, special uses, or grazing permits, and other pre-existing rights and uses would continue. Because most of the roadless area is leased for oil and gas, wilderness attributes could be affected. Options to retain the wilderness characteristics under the recommended wilderness management emphasis are:

1) Honor the lease until expiration. If no discovery was made, then the area would be withdrawn (FLPMA Section 204). If discovery is made in or near the roadless area, then oil and gas development could preclude the retention of the wilderness characteristics in some or all of the area.

2) Buy back the lease through Congressional initiative.

3) Negotiate with leaseholder to relinquish lease or accomodate wilderness resource to the extent possible.

Within the wilderness management emphasis, the area would be withdrawn after expiration if a discovery is not established.

The effects on nonpriced components are as follows:

-- Existing visual conditions would be maintained.
-- Grizzly bear, elk, and other wildlife species would have continued security.
-- Diversity would tend towards climax vegetation. This would depend on what type of fire management programs were implemented.
-- Water quality and fisheries quality would be maintained at natural levels.
-- Local employment and income may decrease from current levels due to a reduced timber base and motorized recreational opportunities.
-- Use of prescribed fire may be restricted to natural fires and would result in decreases in cover/forage ratios and available wildlife forage.
-- Nonrecreation wilderness values, such as clean air and water, natural landscapes, and spiritual fulfillment, would be maximized.
-- Tourism may increase due to the increased primitive recreation opportunities.

The economic and social effects would be greatest in Alternative I which designates all the roadless area to wilderness. The future capacity of the Forest to produce timber and accommodate semiprimitive recreation use would be reduced more than in other alternatives. Maximum displacement of existing uses would occur. Primitive recreation opportunities would increase, while semiprimitive motorized recreation opportunities would decrease.

Alternative IV (Preferred) projects no significant adverse economic or social consequences from designating approximately 19 percent of the area to wilderness. Social and economic effects of Alternatives VII through IX range between Alternative I and IV (Preferred).

Effects of alternative designations of wilderness on local geographic areas are discussed below:

Badger/Two Medicine - The Badger/Two Medicine area is considered unavailable for wilderness classification because of the Blackfoot Treaty Rights on the area.

Teton - Alternatives I, VIII, and IX would fully protect and enhance all wilderness attributes. Some boundaries would be difficult to identify because they would follow limited development along the North and South Forks of the Teton Roads. Alternative VI recommends wilderness classification for the Choteau Mountain and the upper drainages of the Teton River. Alternatives IV (Preferred) and VII designate the Teton Peaks area to wilderness. These alternatives protect the areas with the highest wilderness values, including Route Creek and Headquarters Passes. All of the area is leased for oil and gas.

Deep Creek/Reservoir North - This area was not considered for wilderness classification under any alternative. It was selected for Further Planning.

Renshaw - Alternatives I, VIII, and IX would fully protect and enhance all wilderness attributes. Alternatives V and VI would exclude areas of limited development and would improve management boundaries. Alternatives II, X, XI, and XII designate the Renshaw RARE II area to wilderness. Boundaries along the Ford and Fairview Plateaus would be difficult to identify. Alternatives IV (Preferred) and VII would designate the Allen Mountain-Lange Creek-Patricks Basin area to wilderness. These alternatives protect the area with the highest wilderness values and least resource conflicts. A small part of the area is leased for oil and gas, with no-surface occupancy.

Benchmark/Elk Creek - Alternatives I, VIII, and IX would fully protect and enhance wilderness attributes. The Benchmark Road penetrates about 12 miles into the area, making wilderness boundaries and conflicts along this area difficult to manage. Alternatives V and VI would establish a more manageable boundary and some conflicts would be reduced. Alternatives IV (Preferred) and VII designate only the area with significant wilderness values, few conflicts, and manageable boundaries.

Silver King/Falls Creek - Alternatives I, V, VI, VIII, and IX would fully protect and enhance all wilderness attributes. Alternatives II, X, XI, and XII, which follow the RARE II wilderness recommendation, would exclude areas of limited development and would improve some management boundaries. Alternatives IV (Preferred) and VII would protect the highest wilderness attributes while providing some opportunity to explore for oil and gas resources. Only a small part of the area is currently leased.

Middle Fork Flathead - Alternative I designates the roadless area to wilderness. Impacts on existing uses and potential social and economic effects are the highest under this alternative. All wilderness attributes would be protected. Alternative IX designates all the area to wilderness except the area adjacent to the Lewis and Clark National Forest. Both Alternatives I and IX recommend wilderness designation for areas adjacent to the Great Bear Wilderness which were considered in Forest Service and Congressional reviews of the Great Bear Wilderness but were not designated by Congress. The Slippery Bill Mountain portion of this area was designated as wilderness in Alternative IX and IV (Preferred). This would change the range of recreation opportunities in the area.

East South Fork Flathead - Most of this area is adjacent to the Great Bear Wilderness and was considered for wilderness during Forest Service and Congressional reviews leading to designation of the Great Bear Wilderness. Alternative IV (Preferred) proposes the Limestone Cave area as wilderness. This area would be added to the Bob Marshall Wilderness. There would be little adverse social or economic effect from this recommendation and the boundary would offer improved manageability over the current situation. Most of the area does not contain lands capable of timber management and the tentatively suitable lands would not be managed for timber in all nonwilderness alternatives. Alternative VIII expands the wilderness designation to include all the roadless lands south and east of Spotted Bear. This alternative increases conflicts with future timber and big-game habitat management needs, but provides additional security for elk and grizzly bear. Alternative VIII would have significant effects on potential economic and social use of the area but less than Alternatives I and IX which designates the area to wilderness. Alternatives I and IX would offer maximum protection of wilderness attributes, but would be difficult to manage due to boundary locations.

Swan Crest - Alternative I would fully protect and enhance all wilderness attributes of the area, including designating the Jewel Basin Hiking Area wilderness. The change to wilderness would require additional controls, especially on motorized use, being placed on recreational use. Alternatives V, VI, VIII, and IX recommend wilderness designation on 60 percent of the Swan Crest area. These alternatives recommend classification of the portion of the area with the highest value wilderness attributes, minimizes the conflicts with timber production, and establishes the most manageable boundary for wilderness purposes. The Jewel Basin Hiking Area would be managed as wilderness in all these alternatives. Effects of these alternatives on the Jewel Basin area would be similar to Alternative I. Social and economic effects of these alternatives would result in less adverse change than Alternative I but significantly more than Alternative IV (Preferred). Alternative IV (Preferred) designates 30 percent of the area to wilderness.

Swan Front - Five alternatives (Alternatives I, and V through VIII) would designate wilderness in the Swan Front. Portions of the roadless area not included in this wilderness proposal are fringe areas with high timber values and areas with undesireable management boundaries. Alternative IV (Preferred) recommends wilderness from Bunker Creek south along the same boundary as in Alternatives V through VIII. This area includes the lands with the highest value wilderness attributes in Lion Creek, Upper Squeezer, Bethal, and Lost Creeks and Grizzly Basin. It minimizes displacement of existing use which are incompatible with wilderness. The manageability of the boundary for Alternative IV is improved over other wilderness alternatives from a fire management and protection standpoint. Alternative IX proposes additions in the Bunker Creek, Bruce Ridge, and Upper Sullivan Creek areas providing additional security for grizzly bear and elk. This alternative would affect social and economic relationships less than Alternative I, but more than Alternatives VII through IX.

Monture - Alternatives X through XII propose about 1/2 of the area for wilderness based on the RARE II recommendation. Portions of this area not recommended for wilderness are those areas with high timber values. The upper drainages of Lake, Falls, Monture, Lodgepole, and Dunham Creeks are recommended for wilderness. Alternative III recommends none of the area for wilderness; however, over 1/2 of the area is designated as roadless management because of steep terrain and inaccessibility to timber in the area, consequently protecting the wilderness values. Alternative IX deletes a portion of the unit between McCabe Peak and East Spread Mountain and adds the Monture drainage to the wilderness recommendation. Alternative I would fully protect and enhance all wilderness attributes by designating all acres to wilderness.

Stonewall Mountain - Alternatives I, VIII, and IX would fully protect and enhance all wilderness attributes of the area. These alternatives would designate the entire area as wilderness.

b. **Designation: Wilderness Study**
Management Prescription: Wilderness Study

Deep Creek/Reservoir North is designated Wilderness Study in all alternatives. It has been leased for oil and gas with restrictions on occupancy and only permits exploratory drilling and not production of oil and gas. This leasing decision was based on the need to acquire more information on the area's oil and gas resources. These leases will expire in 1991 if no discoveries are made. Once the oil and gas potential is determined, a recommendation regarding wilderness will be made through an amendment or revision to the Lewis and Clark National Forest Plan.

c. **Designation: Nonwilderness**
Management Prescription: Roadless

Management of areas for roadless recreation would maintain wilderness attributes.

Vegetation management practices for wildlife habitat or other purposes involving prescribed burning may occur. Motorized equipment such as chainsaws, helicopters, motorbikes, and snowmobiles, are often used to facilitate cost-efficient management or maintenance of recreation opportunities. These activities are short-term and limited in scope and would maintain wilderness attributes.

The effects on nonpriced components are as follows:

-- Existing visual conditions would be maintained. Man's activities would not dominate the natural landscape and would not be noticed by the average visitor.
-- Semiprimitive and primitive recreation opportunities would be maintained.
-- Grizzly bear and other wildlife security would be high. Prescription fire would provide for maintenance or improvement of wildlife forage.
-- Diversity would be maintained at current or higher levels.
-- Water quality and fisheries would be maintained or improved.
-- Employment and income from wood products would not be provided.
-- Many nonpriced benefits of the roadless resource, such as landscapes, spiritual values, and high quality watersheds, would be provided.

The roadless resource could be impacted by exploration and development of mineral resources. This resource development is subject to the General Mining Law, Mineral Leasing Laws, and related laws and regulations. The Bureau of Land Management is the final authority for Federal mineral management. If such development is proposed and implemented, it would be integrated into surface resource management to the extent that is reasonable. The most probable mineral development in this area is oil and gas. Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling. The probability of occurrence of a particular activity sharply diminishes with each step.

Although these activities would be mitigated to be consistent with roadless management objectives, some of the nonpriced components would be affected in the field development stage as follows:

-- Existing visual conditions may be temporarily lowered.
-- Introduction of roads and exploration activities adversely affect the quality of the recreation setting.
-- Wildlife security would be reduced and temporary displacement from normal seasonal ranges may occur.
-- Employment and income from the oil and gas resource would be provided.

All alternatives provide for varying amounts of roadless management areas. Effects on local area wilderness attributes are discussed below.

Badger/Two Medicine - All alternatives range between 67 and 85 percent of the area for roadless recreation. In addition, Alternatives I, IV (Preferred), IX, and XII manage about 20,000 acres for range and wildlife in a roadless setting. Under these Alternatives, the entire area would be roadless.

Teton - Alternatives II, III, IV (Preferred), VII, and X through XII designate 63 to 76 percent of the Teton area to roadless recreation. In addition, Alternative XII designates the rest of the area to wildlife and range in a roadless setting. Under this alternative the entire area would be roadless. Alternatives V and VI designated 27 percent of the area to roadless recreation.

Deep Creek/Reservoir North - All alternatives designate a small portion of the area to roadless recreation. Most of the area is in wilderness study.

Renshaw - Alternatives II, III, IV (Preferred), VII, X, XI, and XII designate 28 to 54 percent of the Renshaw area to roadless recreation. In addition, Alternative XII designates the rest of the area to wildlife and range in a roadless setting. Under this alternative the entire area would be roadless. Alternatives V and VI designate 7 percent of the area to roadless recreation (83 percent is designated as wilderness). All alternatives, except I, VIII, IX, and XII designate a small part of the area to development for timber management purposes.

Benchmark/Elk Creek - Alternatives II, III, IV (Preferred), VII, and X through XII designate 59 to 75 percent of the Benchmark area to roadless recreation (0 to 11 percent is designated as wilderness). In addition, Alternative XII designates the rest of the area to wildlife and range in a roadless setting. Under this alternative the entire area would be roadless. Alternatives V and VI designate 3 percent of the area to roadless recreation (81 percent is designated as wilderness).

Silver King/Falls Creek - Alternatives II, IV (Preferred), and VII designate 36 to 64 percent to roadless. In addition, Alternatives IV (Preferred) and VII designate the rest of the area to wildlife and range in a roadless setting. Under these alternatives the entire area would be roadless. Alternatives II, X, XI, and XII designate 6 percent of the area to roadless recreation.

Middle Fork Flathead - Most areas that would be managed as roadless in Alternatives X through XII are areas unsuitable for timber management. Alternative XII maintains wilderness attributes in the Slippery Bill Mountain area.

East South Fork Flathead - Alternatives X through XII designate from 46 to 85 percent of the roadless area for roadless recreation. Most areas that would be managed as roadless are not capable of timber production except the Dean Ridge area on the Spotted Bear River where a large area of tentatively suitable lands are designated as roadless because of economic unsuitability. Alternatives V through VIII designate from 26 to 62 percent of the inventoried roadless acres as roadless. In general, wilderness attributes are maintained in a roadless emphasis in all alternatives.

Swan Crest - Alternatives X through XII maintain a roadless resource from Columbia Mountain to Sixmile Mountain contiguous to the Swan Front area and would not change management of the Jewel Basin Hiking Area. All alternatives that do not recommend wilderness for the Swan Crest maintain the wilderness attributes. Alternatives differ in how the lower elevation fringe areas would be managed. Alternatives II and III would have the most potential to reduce wilderness attributes by designating less area to roadless management and more to timber management.

Swan Front - Alternative XII would manage the Swan Front as roadless. Areas in Grizzly Basin, Lion Creek, and Upper Rumble, Pony, Bethal, and Lost Creek drainages would have high wilderness attributes maintained. Alternative III would manage for roadless recreation along ridgetop trails. Alternatives II and III designate areas which are not capable for timber management for roadless management. Wilderness attributes would be affected by management activities on adjacent lands. Alternative V and Alternatives VII through IX designate ridges unsuitable for timber outside the wilderness recommendations for roadless management. Wilderness attributes would be maintained in most areas. Alternative IV (Preferred) designates high ridges to roadless management from Inspiration Point to Sixmile Mountain.

Monture - Alternatives I, IV (Preferred), and VI through XI designate from 7 to 15 percent of the area to roadless management. Alternative V proposes another 36 percent to roadless, protecting wilderness values in nearly the entire unit. Alternative III recommends over 1/2 of the unit to roadless management, with the remainder of the area designated as a variety of management prescriptions allowing development.

Stonewall Mountain - Alternatives II through VII and X through XII designate from 14 to 50 percent to roadless management. Areas to the north and west of Stonewall Mountain are managed as roadless in all these alternatives. These alternatives also designate from 20 to 47 percent of the area to wildlife and range which would also be managed in a roadless setting.

d. Designation: Nonwilderness
Management Prescription: Wildlife/Range

All alternatives, except Alternative I, designate some roadless areas in which commodity outputs or recreation uses are subordinate to wildlfe and range management. Development and vegetative manipulation may be required to achieve the habitat and forage management objectives. In areas with commercial timber stands, timber may be a byproduct of achieving or maintaining habitat objectives. Timber harvest would occur if enough timber is available and could be used to achieve habitat objectives. Other management activities may include prescribed burning for wildlife or range. On the east side, structural improvements such as installation of watering tanks and fences, may be required to maintain or increase grazing.

Wildlife security and cover requirements include restrictions on human activities and development. Although habitat management activities result in some reductions in wilderness attributes, they are usually short term and limited in scope. Opportunities for solitude and primitive recreation would remain high.

The effects on nonpriced components are as follows:

-- Existing visual conditions would change. Man's activities would be noticed by the average visitor but would not dominate the natural landscape.
-- Semiprimitive recreation opportunities would be provided.
-- Grizzly bear and other wildlife species would have a high level of security and habitat management would maintain, or improve, cover/forage ratios and increase forage.
-- Diversity and nongame species habitat would be provided.
-- Water quality and fisheries habitat would be maintained or improved.
-- Employment associated with livestock production would be maintained or increased.

Oil and gas activity may occur even though it is not designated. Effects from this activity would be the same as discussed under the Roadless Management prescription.

Local effects of the management designation are discussed below:

Badger/Two Medicine - All alternatives designate between 14 and 23 percent of the area to range and wildlife management. Emphasis is on the Badger, Little Badger, and Sawmill areas.

Teton - Alternatives II, IV (Preferred), V, VI, VII, X, XI, and XII designate between 5 and 20 percent of the area to range and wildlife management. Emphasis is on the Deep Creek, Middle Fork Teton, Jones Creek, and Clary Coulee areas.

Deep Creek/Reservoir North - Wildlife habitat management and range management are an important part of the Deep Creek/Reservoir North area; however, most of the area is designated as wilderness study. Small acreages are designated as wildlife under all alternatives.

Renshaw - Alternatives II, III, IV (Preferred), VII, X, XI, and XII designate between 7 and 12 percent of the area to range and wildlife management. Alternatives V and VI designate about 3 percent of the area to range and wildlife management. Emphasis is on the Willow Creek and Ford Plateau areas.

Benchmark/Elk Creek - Alternatives II, III, IV (Preferred), V, VI, VII, X, XI, and XII designate between 14 and 23 percent of the area to range and wildlife management. Emphasis is on the Smith Creek, Cyanide-Baily, Elk Creek, and Steamboat areas.

Silver King/Falls Creek - Alternatives II, III, IV (Preferred), VII, X, XI, and XII designate between 1 and 6 percent of the area to range and wildlife management. Emphasis is on the East Fork of Falls Creek.

Middle Fork Flathead - Only small areas in Challenge Creek are designated in some of the alternatives. No impact on wilderness attributes would occur.

East South Fork Flathead - Alternative XII would manage roadless lands in the Spotted Bear area for grizzly bear habitat. No impact on roadless lands would occur.

Swan Crest - Alternatives IX and XII designate significant areas to grizzly bear habitat south and east of Jewel Basin. The wilderness attributes would be maintained. In addition, all alternatives, except Alternative I, designate some land on the west side of Columbia Mountain as big game habitat. Prescribed burning to increase forage production would have little effect on wilderness attributes.

Swan Front - All alternatives, except Alternatives II, III, and XII, designate large areas to wildlife. The Bunker Creek drainage would be managed for grizzly bear habitat in Alternatives VI, VII, VIII, and XI. No management activities would occur that would modify wilderness attributes. Alternatives IX and XII expand the grizzly emphasis north from Bunker Creek to include all the Bruce Ridge and Upper Sullivan drainage to Sixmile Mountain. These management practices, which include prescribed burning, would have little effect on wilderness attributes.

Monture - None of the alternatives designate large areas for these uses. However, Alternatives III and IV (Preferred) emphasize management within essential grizzly bear habitat. Alternative I designates all acres to wilderness. Some wildlife needs are met through wilderness and roadless designations.

Stonewall Mountain - Alternatives II through VII and X through XII designate between 20 and 47 percent of the area to range/wildlife. Most of the area under this management would remain roadless.

e. **Designation: Nonwilderness**
Management Emphasis: Timber Management Without Roads

Only the west side has areas designated as timber management without roads. This includes areas with commercial timber on steep, rugged terrain mostly within 1 mile of a road. Logging would employ aerial yarding systems, and no roads would be constructed. Implementation would impact the vegetation and would not reach long distances into roadless areas. Because the land would not be roaded, wilderness attributes could be easily reclaimed after implementation by vegetative growth. Implementation would proceed slowly for all alternatives with this emphasis. Only a few hundred acres would be affected in Decades 1 and 2. Most areas would schedule harvesting by Decade 5 when economic efficiency is the best. This management would not have any significant economic or social effects until Decade 4, when implementation would increase. The first decade timber harvest scheduled under this prescription could be relocated to other areas without affecting objectives or outputs of the alternative.

The effects on nonpriced components are as follows:

-- Existing visual conditions would change and would be noticed by the average visitor. Man's activities may dominate the landscape in some local areas.
-- Semiprimitive nonmotorized recreation opportunities would be provided. Wilderness attributes would be retained.
-- Elk and grizzly security would be maintained.
-- Diversity of plant and animal communities would be maintained or improved in the long term.
-- Water quality and fisheries would not be affected.
-- Some support of local employment and income would occur in Decade 4 and later.

All alternatives, except Alternative I, manage portions of this area for timber management without roads. Alternatives which make the most extensive use of these prescriptions are Alternatives IV (Preferred), VII, X, and XI. Alternatives IV (Preferred), VII, and XI would have the greatest effect. This prescription would not be implemented in the Swan Front or Swan Crest until after the first decade. Alternative III would affect the Slippery Bill, Lion Creek, and Squeezer Creek drainages of the Swan Front in Decade 5.

Oil and gas activity would be limited to seismic surveys. Because all slopes in this management prescription are greater than 60 percent, all areas leased contain no-surface occupancy stipulations.

f. Designation: Nonwilderness
Management Emphasis: Timber Management With Roads

All alternatives, except Alternative I, designate some portions of the area for timber. The consequences of this management decision are a loss of wilderness attributes at the time timber harvest and roading occurs. The wilderness attributes are foregone if this management direction is implemented.

The effects on nonpriced components are as follows:

- -- Existing visual conditions would change and man's activities may dominate the landscape and would be noticed by the average visitor.
- -- Wilderness attributes would be foregone.
- -- Elk security and big game hunting opportunities would be reduced.
- -- Diversity would increase.
- -- Water quality and fisheries would be adversely affected.
- -- Grizzly bear and gray wolf habitat would become less effective.
- -- Local economic stability would be provided by supporting the highest level of wood products industry jobs.

Oil and gas activities would be compatible with this emphasis.

These prescriptions provide for a wide range of multiple use benefits, both priced and nonpriced.

Badger/Two Medicine - Alternative X would develop all of the Badger/Two Medicine area. Alternative XI would develop about 50 percent of the area. Alternatives II and VIII would develop about 25 percent of the area. Alternatives I, III, V, VI, VII, and IX would develop about 7 percent of the area. Road construction and timber harvest would take place in the Two Medicine drainage. Mitigation measures would be implemented to protect the grizzly bear. Lodgepole pine and Douglas-fir stands would be accessed with roads and harvesting would be scheduled starting in the second decade. All of the area would be available for wilderness reevaluation during the next planning period. Alternatives V, VI, and VII designate some acres (3,000 to 4,000) to wildlife where timber harvest is used to achieve habitat objectives. Alternatives II, III, VIII, X, and XI designate small acres (136 to 370) to a wildlife/timber prescription.

Teton - Alternative X would develop all of the Teton area, Alternative II would develop 90 percent of the area, Alternative XI would develop about 50 percent of the area, Alternatives IV (Preferred) and VII would develop about 30 percent, and Alternatives V and VI would develop about 10 percent of the area. Road construction and timber harvest would be extended into the West Fork and South Fork of the Teton. Mitigation measures would be implemented to protect grizzly bear habitat. Lodgepole pine and Douglas-fir stands would be accessed with roads and harvesting would be scheduled starting in the second decade.

Deep Creek/Reservoir North - Timber management activities are not scheduled in the Deep Creek/Reservoir North area.

Renshaw - Alternative X would develop 45 percent of the Renshaw area. Alternative II would develop about 35 percent of the area. Alternative XI would develop about 23 percent of the area. Alternatives III, IV (Preferred), and VII would develop about 14 percent and Alternatives V and VI would develop about 5 percent of the area. Road construction and timber harvest would take place along the Beaver-Willow Road. Mitigation measures would be implemented to protect grizzly bear habitat. Lodgepole pine and Douglas-fir stands would be accessed with roads and harvesting would be scheduled starting in the second decade.

Benchmark/Elk Creek - Alternative X would develop all of the Benchmark/Elk Creek area. Alternative II would develop about 90 percent of the area. Alternative XI would develop about 50 percent of the area. Alternatives IV (Preferred) and VII would develop about 30 percent, and Alternatives V and VI would develop about 10 percent of the area. Most development would take place along the Benchmark Road. Roads would also be constructed into the Elk Creek drainage. Mitigation measures would be implemented to protect grizzly bear habitat. Lodgepole pine and Douglas-fir stands would be accessed with roads, and harvesting would be scheduled stocking in the second decade. All of the area would be available for wilderness reevaluation during the next planning period.

Silver King/Falls Creek - Alternative X would develop a small portion of the Silver King/Falls Creek area. About 3,500 acres in the lower Falls Creek drainage would be developed starting in the second decade. The topography of much of the area consists of high elevation alpine ridges not capable of commercial timber production. These lands form the bulk of the area. Lower elevation fringe areas and stringers of tentatively suitable timber lands in drainages intrude into the area. These lands are usually located along roads. Areas may have future opportunities to be evaluated for inclusion in the wilderness system. All of the area would be available for wilderness reevaluation during the next planning period.

Middle Fork Flathead and East South Fork Flathead - Timber harvest would affect fringes of the East Side and Middle Fork geographic areas in all alternatives except Alternatives I and IX. Economic and social effects would be greatest under Alternative III. Alternative III would implement the highest level of timber harvest and roading. It would provide the highest level of support to local employment and income and the most significant reduction of roadless acres and wilderness attributes. Alternative IV (Preferred) recommends areas with high timber values and lowest wilderness values for timber management. Other alternatives examine variations within the roadless area of the effects of timber management on local areas.

Swan Crest - Portions of the Swan Crest are designated as timber management in all alternatives except Alternative I. Alternatives II, III, and X would make significant intrusions into this area. This includes the Fawn Creek/Aurora Creek drainages which would be accessed in Decade 1. All other alternatives designate timber harvesting in the highly productive fringe areas, leaving at least 70 percent in a roadless setting.

Swan Front - Implementation of these prescriptions in Lion Creek and the upper reaches of Squeezer and Bethal Creeks would make significant intrusions into areas considered high in roadless values. Alternative II, III, and X would schedule timber harvest in Lion Creek below the falls in Decade 1. The mature cedar grove would not be included in the timber harvest area, but wilderness attributes of the grove would be affected. Morrell Falls is protected in all alternatives.

Monture - The Monture drainage, which serves as an important entrance to the established wilderness area, is not developed in any alternative. Alternatives II and X propose development in the timber areas located at the lower elevations along the boundary of the roadless area. Alternative II also applies visual prescriptions in most timber management areas. In all alternatives which designate acreage to timber management, a core in the upper drainages of this area remains roadless. Timber management would include lower elevation and fringe area

Stonewall Mountain - Alternative II develops about 2/3 of the area and only excludes high elevation, nonproductive land. Alternatives III through VII and X through XII designate the fringe areas of highly productive land to timber management. This includes Yukon Creek, Telegraph Creek, and Porcupine Basin. The majority of the area would remain in a roadless setting in these alternatives.

APPENDIX D

MINERALS

Acres Impacted by Special Stipulations and Controls - Flathead National Forest

In order to standardize the comparison of each alternative on the probable effects of mineral resource development, four land categories have been established. They are:

Category A: In this category, surface and subsurface resource conflicts are resolved through mineral withdrawal - existing or proposed.

Category B: In this category, certain surface resources are protected by Statute, Executive Orders, or mitigation measures.

Category C: In this category, the Regional Forester has specified certain protective stipulations to protect special surface values.

Category D: These are lands where no special stipulations other than the normal standard stipulations. There are no Class D lands on the Flathead National Forest.

In addition to the four categories, the following tables are further divided into Energy Minerals and Non-Energy Minerals. On the Flathead National Forest, Energy Minerals mean oil and gas resources.

ENERGY MINERALS

	Total Flathead National Forest Acres	CATEGORY "A" LAND (Acres) Surface and Subsurface Conflicts Resolved through Existing or Proposed Withdrawals					
Alternative	Column 1	Wild River* 2	Research Natural Areas 3	Wilderness (Wilderness Act)** 4	Jewel Basin *** 5	Total Withdrawals 6 (Col. 2+3+4+5)	Total National Forest Open to Energy Development 7 (Col. 1-6)
1	2,330,327	2,358	2,403	1,069,954	3,200	1,077,915	1,252,412
2	2,330,327	2,358	1,320	1,069,954	-	1,073,632	1,256,695
3	2,330,327	2,358	2,403	1,069,954	3,200	1,077,915	1,252,412
4	2,330,327	2,358	2,403	1,069,954	-	1,074,715	1,225,612
5	2,330,327	2,358	2,403	1,069,954	3,200	1,077,915	1,252,412
6	2,330,327	2,358	1,803	1,069,954	-	1,074,115	1,256,212
7 CD	2,330,327	2,358	1,803	1,069,954	-	1,074,115	1,256,212
8	2,330,327	2,358	2,403	1,069,954	3,200	1,077,915	1,252,412
PNV	2,330,327	2,358	1,320	1,069,954	-	1,073,632	1,256,695
9	2,330,327	2,358	2,403	1,565,323	-	1,614,408	760,243
10	2,330,327	2,358	2,403	1,266,737	-	1,271,498	1,058,829
11	2,330,327	2,358	2,403	1,118,808	3,200	1,126,769	1,203,558
12	2,330,327	2,358	2,403	1,152,443	3,200	1,160,404	1,169,923
13	2,330,327	2,358	2,403	1,213,206	-	1,217,967	1,112,360
14	2,330,327	2,358	2,403	1,266,640	-	1,271,401	1,058,926
15	2,330,327	2,358	2,403	1,330,159	-	1,334,920	995,407
16	2,330,327	2,358	2,403	1,443,778	-	1,448,539	881,788
17 PA	2,330,327	2,358	2,403	1,168,034	-	1,172,795	1,157,532

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* Acres outside wilderness

** 1,069,954 acres of this amount were existing wilderness, not under mineral claim or lease as of January 1, 1984, and are therefore permanently withdrawn by the 1964 Wilderness Act. The remaining acreage is presently open to energy development, and if under an existing lease agreement, will be allowed to run the normal lease period, after which, the leases will be terminated. No new leases will be issued if an area is designated by Congress as wilderness. This wilderness acreage included 22,162 acres of "wild" river area withdrawn by Congress.

*** The interior portions of Jewel Basin, totaling 3,200 acres, which cannot be accessed without surface occupancy and which cannot be accessed through directional drilling from outside of Jewel Basin will be withdrawn from oil and gas leasing. The remainder of Jewel Basin is listed in Category "C".

ENERGY MINERALS

	Total Flathead National Forest Acres Column 1	CATEGORY "B" LAND (Acres) Special Stipulations Required by Executive Order, Statute, or Regulation			
Alternative		Flood Plains (E.O. 11988) Wetlands (E.O. 11990) 2	Riparian Areas (National Forest Management Act) 3	Grizzly Bear Management Emphasis (Endangered Species Act)* 4	Total Category "B" 5 (Col. 2+3+4)
1	2,330,327	14,184	27,145	322,097	363,426
2	2,330,327	14,184	27,145	-	41,329
3	2,330,327	14,184	27,145	37,695	79,024
4	2,330,327	14,184	27,145	-	41,329
5	2,330,327	14,184	27,145	-	41,329
6	2,330,327	14,184	27,145	-	41,329
7 CD	2,330,327	14,184	27,145	35,305	76,634
8	2,330,327	14,184	27,145	94,197	135,526
PNV	2,330,327	14,184	27,145	-	41,329
9	2,330,327	14,184	27,145	94,197	135,526
10	2,330,327	14,184	27,145	-	41,329
11	2,330,327	14,184	27,145	94,197	135,526
12	2,330,327	14,184	27,145	80,924	122,253
13	2,330,327	14,184	27,145	80,886	122,215
14	2,330,327	14,184	27,145	31,697	73,026
15	2,330,327	14,184	27,145	20,576	61,905
16	2,330,327	14,184	27,145	140,975	182,304
17 PA	2,330,327	14,184	27,145	108,732	150,061

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* This acreage could change when the U.S. Fish and Wildlife Service establishes "critical" habitat for threatened and endangered species. Currently, about 2,000,000 acres of the Flathead National Forest includes occupied habitat for Grizzly Bear or Bald Eagle or Peregrine Falcon or Gray Wolf. All activities in these areas will require the standard Endangered or Threatened Species Stipulation and Activity Coordination Stipulation (MT-3109-7).

ENERGY MINERALS

Alternative	Total Flathead National Forest Acres Column 1	CATEGORY "C" LAND (Acres) Special Stipulations by the Regional Forester Due to Special Surface Resources					
		Visual Retention w/o Roads Acres 2	Visual Partial Retention w/o Roads Acres 3	Whitetailed Deer & Mule Deer & Elk Winter Range Acres 4	Big Mountain Acres 5	Administration Sites Acres 6	Coram Experimental Forest Acres 7
1	2,330,327	-	2,144	26,258	2,000	465	8,020
2	2,330,327	3,778	-	51,043	3,574	465	8,020
3	2,330,327	4,077	9,808	51,317	3,474	463	8,020
4	2,330,327	8,292	-	45,298	3,474	465	8,020
5	2,330,327	857	587	62,725	3,499	462	8,020
6	2,330,327	-	-	24,986	2,343	285	8,020
7 CD	2,330,327	4,136	-	37,158	2,000	-	8,020
8	2,330,327	4,077	8,513	53,514	3,574	463	8,020
PNV	2,330,327	-	-	21,249	2,343	285	8,020
9	2,330,327	-	-	7,719	3,574	463	8,020
10	2,330,327	857	587	59,788	3,499	462	8,020
11	2,330,327	4,077	8,513	53,514	3,574	463	8,020
12	2,330,327	3,953	8,513	53,448	3,574	463	8,020
13	2,330,327	3,203	8,302	50,619	3,574	463	8,020
14	2,330,327	3,203	8,302	50,619	3,574	463	8,020
15	2,330,327	3,203	8,302	48,715	3,574	463	8,020
16	2,330,327	-	1,264	23,277	2,000	465	8,020
17 PA	2,330,327	-	7,551	65,600	3,574	465	8,020

ENERGY MINERALS

Alternative	Total Flathead National Forest Acres Column 1	CATEGORY "C" LAND (Acres) cont'd. Amenity Values Acres 8	Developed Recreation Sites Acres 9	Dispersed Roadless Recreation Acres 10	Recreation & Scenic River Corridors 11	Jewel Basin* 12	Subtotal Special Mgmt. Areas in Category "C" 13 (Col. 2 through 12)	Other** Mgmt. Areas in Category "C" 14	Total Category "C" 15 (Col. 13+14)
1	2,330,327	49,657	184	268,268	11,480	12,168	380,644	508,342	888,986
2	2,330,327	10,358	215	347,159	-	-	424,612	790,754	1,215,366
3	2,330,327	29,762	215	355,872	11,480	12,168	486,646	686,742	1,173,388
4	2,330,327	-	136	103,199	-	-	168,884	1,045,399	1,214,283
5	2,2330,327	114,763	210	325,756	11,480	12,168	540,527	670,554	1,211,083
6	2,330,327	-	447	344,108	-	-	380,189	834,694	1,214,883
7 CD	2,330,327	-	2,234	374,689	-	-	428,237	751,341	1,179,578
8	2,330,327	33,536	215	313,348	11,480	12,168	448,908	667,978	1,116,886
PNV	2,330,327	49,657	447	283,426	-	-	365,427	849,939	1,215,366
9	2,330,327	10,358	215	73,798	11,480	-	115,627	464,939	580,393
10	2,330,327	104,994	210	161,218	11,480	-	351,115	666,385	1,017,500
11	2,330,327	33,536	215	268,216	11,480	12,168	403,776	619,932	1,068,032
12	2,330,327	33,421	215	250,750	11,480	12,168	386,005	661,665	1,047,670
13	2,330,327	31,010	215	216,078	11,480	-	332,964	657,181	990,145
14	2,330,327	31,010	215	214,578	11,480	-	331,464	654,436	985,900
15	2,330,327	30,400	215	181,016	11,480	-	295,388	638,114	933,502
16	2,330,327	34,957	184	126,993	11,480	-	208,640	490,844	699,484
17 PA	2,330,327	40,357	314	228,677	11,480	-	288,379	719,092	1,007,471

* Portions of Jewel Basin within 1 mile of its exterior boundary will be leased with an NSO stipulation. This area can be accessed through directional drilling from outside of Jewel Basin.

** Other areas with less restrictive special stipulations; i.e., timber producing areas.

NONENERGY MINERALS

Alternative	Total Flathead National Forest Acres Column 1	CATEGORY "A" LAND (Acres) Surface (Subsurface Conflicts Resolved through Existing or Proposed Withdrawals						Total National Forest Open to Nonenergy Mineral Development 8 (Col. 1-7)
		Wild River 2	Research Natural Areas 3	Recreational & Scenic River Corridors 4	Wilderness (Wilderness Act)* 5	Jewel Basin 6	Total Withdrawals 7 (Col. 2+3+4+5+6)	
1	2,330,327	2,358	2,403	11,480	1,069,954	15,368	1,101,563	1,228,764
2	2,330,327	2,358	1,320	-	1,069,954	-	1,073,632	1,256,695
3	2,330,327	2,358	2,403	11,480	1,069,954	15,368	1,101,563	1,228,764
4	2,330,327	2,358	2,403	-	1,069,954	-	1,074,715	1,255,612
5	2,330,327	2,358	2,403	11,480	1,069,954	15,368	1,101,563	1,228,764
6	2,330,327	2,358	1,803	-	1,069,954	-	1,074,115	1,256,212
7 CD	2,330,327	2,358	1,803	-	1,069,954	-	1,074,115	1,256,212
8	2,330,327	2,358	2,403	11,480	1,069,954	15,368	1,101,563	1,228,764
PNV	2,330,327	2,358	1,320	-	1,069,954	-	1,073,632	1,256,695
9	2,330,327	2,358	2,403	11,480	1,565,323	-	1,581,564	748,763
10	2,330,327	2,358	2,403	11,480	1,266,737	-	1,282,978	1,047,349
11	2,330,327	2,358	2,403	11,480	1,118,808	15,368	1,150,417	1,179,910
12	2,330,327	2,358	2,403	11,480	1,152,443	15,368	1,184,052	1,146,275
13	2,330,327	2,358	2,403	11,480	1,213,206	-	1,229,447	1,100,880
14	2,330,327	2,358	2,403	11,480	1,266,640	-	1,282,881	1,047,446
15	2,330,327	2,358	2,403	11,480	1,330,159	-	1,346,400	983,927
16	2,330,327	2,358	2,403	11,480	1,443,778	-	1,460,019	870,308
17 PA	2,330,327	24,520	2,403	11,480	1,168,034	-	1,184,275	1,146,052

* Acres outside wilderness.

** All designated wildernesses were permanently withdrawn on December 31, 1983, by the Wilderness Act, from all forms of mineral activity. During this interim period, the intention of Congress and Secretary of Interior seems to be to not issue oil and gas leasing in wildernesses. This wilderness acreage included 22,162 acres of "wild" river area withdrawn by Congress.

NONENERGY MINERALS

Alternative	Total Flathead National Forest Acres Column 1	CATEGORY "B" LAND (Acres) Special Stipulations Required by Executive Order, Statute, or Regulation Flood Plains (E.O. 11988) Wetlands (E.O. 11990) 2	Riparian Areas (National Forest Management Act) 3	Grizzly Bear Management Emphasis (Endangered Species Act)* 4	Total Category "B" 5 (Col. 2+3+4)
1	2,330.,327	14,184	27,145	322,097	363,242
2	2,330,327	14,184	27,145	-	41,329
3	2,330,327	14,184	27,145	37,695	79,024
4	2,330,327	14,184	27,145	-	41,329
5	2,330,327	14,184	27,145	-	41,329
6	2,330,327	14,184	27,145	-	41,329
7 CD	2,330,327	14,184	27,145	35,305	76,634
8	2,330,327	14,184	27,145	94,197	135,526
PNV	2,330,327	14,18-	27,145	-	41,329
9	2,330,327	14,184	27,145	94,197	135,526
10	2,330,327	14,184	27,145	-	41,329
11	2,330,327	14,184	27,145	94,197	135,526
12	2,330,327	14,184	27,145	80,924	122,253
13	2,330,327	14,184	27,145	80,886	122,215
14	2,330,327	14,184	27,145	31,697	73,026
15	2,330,327	14,184	27,145	20,576	61,905
16	2,330,327	14,184	27,145	140,975	182,304
17 PA	2,330,327	14,184	27,145	108,732	150,061

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* This acreage could change when the U.S. Fish & Wildlife Service Establishes "critical" habitat for threatened and endangered species. Currently, about 2,000,000 acres of the Flathead National Forest includes occupied habitat for Grizzly Bear or Bald Eagle or Peregrine Falcon or Grey Wolf. All activities in these areas will require the standard Endangered or Threatened Species Stipulation and Activity Coordination Stipulation (MT-3109-7).

NONENERGY MINERALS

Alternative	Total Flathead National Forest Acres Column 1	CATEGORY "C" LAND (Acres) Special Stipulations by the Regional Forester Due to Special Surface Resources					Coram Experimental Forest Acres
		Visual Retention w/o Roads Acres 2	Visual Partial Retention w/o Roads Acres 3	Whitetailed Deer & Mule Deer & Elk Winter Range Acres 4	Big Mountain Acres 5	Administration Sites Acres 6	7
1	2,330,327	-	2,144	26,258	2,000	465	8,020
2	2,330,327	3,778	-	51,043	3,574	465	8,020
3	2,330,327	4,077	9,808	51,317	3,474	463	8,020
4	2,330,327	8,292	-	45,298	3,474	465	8,020
5	2,330,327	857	587	62,725	3,499	462	8,020
6	2,330,327	-	-	24,986	2,343	285	8,020
7 CD	2,330,327	4,136	-	37,158	2,000	-	8,020
8	2,330,327	4,077	8,513	53,514	3,574	463	8,020
PNV	2,330,327	-	-	21,249	2,343	285	8,020
9	2,330,327	-	-	7,719	3,574	463	8,020
10	2,330,327	857	587	59,788	3,499	462	8,020
11	2,330,327	4,077	8,513	53,514	3,574	463	8,020
12	2,330,327	3,953	8,513	53,448	3,574	463	8,020
13	2,330,327	3,203	8,302	50,619	3,574	463	8,020
14	2,330,327	3,203	8,302	50,619	3,574	463	8,020
15	2,330,327	3,203	8,302	48,715	3,574	463	8,020
16	2,330,327	-	1,264	23,277	2,000	465	8,020
17 PA	2,330,327	-	7,551	65,600	3,574	465	8,020

NONENERGY MINERALS

Alternative	Total Flathead National Forest Acres Column 1	CATEGORY "C" LAND (Acres) cont'd Amenity Values Acres 8	Developed Recreation Sites Acres 9	Dispersed Roadless Recreation Acres 10	Subtotal Special Mgmt. Areas in Category "C" 11 (Col. 2 through 10)	Other Mgmt. Areas in Category "C" 12	Total Category "C" 13 (Col. 11+12)
1	2,330,327	49,657	184	268,268	356,996	508,526	865,522
2	2,330,327	10,358	215	347,159	424,612	790,754	1,215,366
3	2,330,327	29,762	215	355,872	463,008	686,732	1,149,740
4	2,330,327	-	136	103,199	168,884	1,045,399	1,214,283
5	2,330,327	114,763	210	325,756	516,879	670,556	1,187,435
6	2,330,327	-	447	344,108	380,189	834,694	1,214,883
7 CD	2,330,327	-	2,234	374,689	428,237	751,341	1,179,578
8	2,330,327	33,536	215	313,348	425,260	667,798	1,093,238
PNV	2,330,327	49,657	447	283,426	365,427	849,939	1,215,366
9	2,330,327	10,358	215	73,798	104,147	509,090	613,237
10	2,330,327	104,994	210	161,218	339,635	666,385	1,006,020
11	2,330,327	33,536	215	268,216	380,128	664,256	1,044,384
12	2,330,327	33,421	215	250,750	362,357	661,665	1,024,022
13	2,330,327	31,010	215	216,078	321,484	657,181	978,665
14	2,330,327	31,010	215	214,578	319,984	654,436	974,420
15	2,330,327	30,400	215	181,016	283,908	638,114	922,022
16	2,330,327	34,957	184	126,993	197,160	490,844	688,004
17 PA	2,330,327	40,357	314	228,677	354,558	641,433	995,991

* Other areas with less restrictive special stipulations; i.e., timber producing areas.

ENERGY MINERAL POTENTIAL AND LAND CLASS SUMMARY

All of the Flathead National Forest is considered high potential for energy resources. High potential is defined as being an area having many of the broad Regional characteristics as well as a few of the more detailed features associated with the occurrence of oil and gas resources.

The following is a summary of acres by land class for each alternative.

Land	Alternative								
Category	1	2	3	4	5	6	7 CD	8	PNV
A	1,077,915	1,073,632	1,077,915	1,074,715	1,077,915	1,074,115	1,074,115	1,077,915	1,073,632
B	363,426	41,329	79,024	41,329	41,329	41,329	76,634	135,526	41,329
C	888,986	1,215,366	1,173,388	1,214,283	1,211,083	1,214,883	1,179,578	1,116,886	1,215,366
D	0	0	0	0	0	0	0	0	0
Total	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327

Land	Alternative								
Category	9	10	11	12	13	14	15	16	17 PA
A	1,614,408	1,271,498	1,126,769	1,160,404	1,217,967	1,271,401	1,334,920	1,448,539	1,172,795
B	135,526	41,329	135,526	122,253	122,215	73,026	61,905	182,304	150,061
C	580,393	1,017,500	1,068,032	1,047,670	990,145	985,900	933,502	699,484	1,007,471
D	0	0	0	0	0	0	0	0	0
Total	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327

NONENERGY MINERAL POTENTIAL AND LAND CLASS SUMMARY

All of the Flathead National Forest is considered as having low potential for nonenergy minerals resources. Low potential is defined as an area that has none of the characteristics normally associated with the occurrence of non-energy mineral resources.

The following is a summary of acres by land class for each alternative.

Land	Alternative								
Category	1	2	3	4	5	6	7 CD	8	PNV
A	1,101,563	1,073,632	1,101,563	1,074,715	1,101,563	1,074,115	1,074,115	1,101,563	1,073,632
B	363,242	41,329	79,024	41,329	41,329	41,329	76,634	135,526	41,329
C	865,522	1,215,366	1,149,740	1,214,283	1,187,435	1,214,883	1,179,578	1,093,238	1,215,366
D	0	0	0	0	0	0	0	0	0
Total	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327

Land	Alternative								
Category	9	10	11	12	13	14	15	16	17 PA
A	1,581,564	1,282,978	1,150,417	1,184,052	1,229,447	1,282,881	1,346,400	1,460,019	1,184,275
B	135,526	41,329	135,526	122,253	122,215	73,026	61,905	182,304	150,061
C	613,237	1,006,020	1,044,384	1,024,022	978,665	974,420	922,022	688,004	995,991
D	0	0	0	0	0	0	0	0	0
Total	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327	2,330,327

ACRES OF ACCESSIBLE LAND - FLATHEAD NATIONAL FOREST.
(THE POTENTIAL FOR MINERALS (OIL & GAS) IS CONSIDERED TO BE HIGH AT THIS TIME, AUGUST 1983)

	Restriction	Reason for Restriction	Glacier View		Hungry Horse		Spotted Bear		Swan Lake		Tally Lake		Forest Total	
			Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
A	No	Alpine Glacier Tills	45727	15.07	13304	4.95	5494	2.98	8969	3.17	370	0.16	73864	5.82
		Mass Failures	2236	0.74	2795	1.04	6506	3.53	156	0.06	891	0.39	12584	0.99
C	Surface	Alpine Ridges & Rockland	70668	23.29	43671	16.26	43458	23.61	53638	18.93	10617	4.61	222052	17.48
		Future Breaks	6023	1.98	4778	1.78	2309	1.25	1663	0.59	595	0.26	15368	1.21
C	Occupancy	Structural Breaks-No Rds	13976	4.61	19181	7.14	9422	5.12	13364	4.72	3706	1.61	59649	4.70
E		TOTAL	138630	45.68	83729	31.17	67189	36.50	77790	27.45	16179	7.02	383517	30.20
S														
	High	Flood Plains	3245	1.07	3988	1.48	2120	1.15	3423	1.21	4489	1.95	17265	1.36
S		Wet Lands	90	0.03	205	0.08	113	0.06	825	0.29	5275	2.29	6508	0.51
	Restrict-	Avalanche Fans	197	0.06	476	0.18	1332	0.72	0	0.00	0	0.00	2005	0.16
I		Residual Soils 0-40%	5407	1.78	6587	2.45	13525	7.35	27791	9.81	24416	10.59	77726	6.12
	ions	Residual Soils 40-60%	7460	2.46	25475	9.48	7672	4.17	35420	12.50	36650	15.90	112677	8.87
B		Glacial Trough Walls	77265	25.46	62769	23.37	39327	21.37	34597	12.21	6174	2.68	220132	17.33
		Structural Breaks-Roaded	13975	4.60	19180	7.14	9421	5.12	13363	4.72	3705	1.61	59644	4.70
I														
		TOTAL	107639	35.47	118680	44.18	73510	39.94	115419	40.73	80709	35.02	495957	39.05
L														
I	Moderate	Alluvial Fans & Outwash	10869	3.58	6797	2.53	7246	3.94	6496	2.29	7090	3.08	38498	3.03
		Silty Tills	44108	14.53	44813	16.68	29756	16.17	57587	20.32	60072	26.07	236336	18.61
T	Restrict-	Sandy Tills	0	0.00	7753	2.89	3620	1.97	13148	4.64	11648	5.05	36169	2.85
		Clayey Tills	0	0.00	5482	2.04	2460	1.34	1661	0.59	0	0.00	9603	0.76
Y	ions	Glacial Tills 40-60%	2233	0.74	1364	0.51	280	0.15	11262	3.97	54752	23.76	69891	5.50
		TOTAL	57210	18.85	66209	24.65	43362	23.56	90154	31.82	133562	57.96	390497	30.75
		GRAND TOTAL	303479	100.00	268618	100.00	184061	100.00	283363	100.00	230450	100.00	1269971	100.00

NOTE: ACCESSIBILITY AND REASON FOR RESTRICTION (LAND TYPES) ARE SUBJECT TO CHANGE AS DATA ARE REFINED.

APPENDIX E

NORTHERN CONTINENTAL DIVIDE ECOSYSTEM

A. DESCRIPTION

The grizzly bear was identified as a "threatened" species in 1975 under provisions of the Endangered Species Act. As such, the species and its habitat receive a special protective status in all Federal programs and activities. There are two major grizzly bear population centers and four other areas containing self-perpetuating or remnant populations in the lower 48 States. The two major areas are known as the Yellowstone Ecosystem population and the Northern Continental Divide Ecosystem population in Northwestern Montana. These two ecosystems appear to provide the best potential for survival and recovery of this species in the lower 48 States.

Although the Northern Continental Divide population may not have been studied as intensively as the Yellowstone, a considerable body of research is available to direct management. Data is available from Glacier National Park (Martinka), Border Grizzly Project (Jonkel), and the East Front Studies (Aune). Adaptable research from the Yellowstone Ecosystem also furnishes considerable information valuable for management.

There are 5.7 million acres of occupied grizzly bear habitat in the Northern Continental Divide Ecosystem with varied population estimates of 440 to 680* bears. It includes Glacier National Park, parts of the Flathead and Blackfeet Indian Reservations, parts of 5 National Forests (Flathead, Helena, Kootenai, Lewis & Clark, and Lolo), Bureau of Land Management parcels, and a significant amount of State and private lands. Four wildernesses (Bob Marshall, Mission Mountains, Great Bear, and Scapegoat) are included. The area is contiguous to Canadian grizzly bear populations and an interchange of bears is assumed.

One very important aspect of this ecosystem is that it embraces the only part of the Great Plains where grizzly bears can still be found along a narrow strip of plains habitat bordering the eastern slopes of the Rocky Mountains, commonly called the Rocky Mountain Front.

Occupied grizzly bear habitat in the NCDGBE is being disaggregated in MS (Management Situations) 1, 2, and 3, based on grizzly bear habitat value and population distribution. If changes in grizzly bear population and distribution occur, restratification of these categories may become necessary. Habitat suitability, combined with consistent grizzly bear observations and analysis of habitat components, would be the basis for restratification.

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* Grizzly Bear Recovery Plan.

B. MANAGEMENT SITUATIONS*

1. MANAGEMENT SITUATION 1

a. Population and Habitat Conditions

The area contains grizzly bear population centers (areas key to the survival and recovery of grizzlies where seasonal or yearlong grizzly activity, under natural, free-ranging conditions is common**) and habitat components needed for the survival and recovery of the species or a segment of its population. The probability is very great that major Federal activities or programs may affect (have direct or indirect relationships to the conservation and recovery of) the grizzly bear.

b. Management Direction

Grizzly bear habitat maintenance and improvement (improvement applies to Forest Service only), and grizzly-human conflict minimization will receive high management priority (FSM 2603). Management decisions will favor the needs of the grizzly bear when grizzly bear habitat and other land-use values compete. Land uses which can affect grizzlies and/or their habitat will be made compatible with grizzly bear needs or such uses will be disallowed or eliminated. Grizzly-human conflicts will be resolved in favor of grizzlies unless the bear involved is determined to be a nuisance**. Nuisance bears may be controlled through either relocation or removal but only if such control would result in a more natural free-ranging grizzly bear population and all reasonable measures have been taken to protect the bear and/or its habitat (including area closures and/or activity curtailments).

2. MANAGEMENT SITUATION 2

a. Population and Habitat Conditions

The area lacks distinct grizzly bear population centers; highly suitable habitat does not generally occur, although some grizzly habitat components exist and grizzlies may be present occasionally. By definition, Management Situation 2 areas are those considered unnecessary for survival and recovery, although the status of such areas is subject to review and change according to demonstrated grizzly bear population and habitat needs. The affects of major Federal activities or programs on the conservation and recovery of the species are not generally predictable.

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* This language may change based on the evaluation of public comment on the Interagency Guidelines on Management of the Grizzly Bear published in the Federal Register, May 28, 1985.

** Guidelines for Management involving Grizzly Bears in the Greater Yellowstone Area, December 1979.

b. Management Direction

The grizzly bear habitat management is an important, but not the primary, use of the area. Habitat maintenance and improvement and grizzly-human conflict minimization may be, in some cases, important, but not the most important management considerations.

Demonstrated grizzly bear populations and/or grizzly bear habitat use will be accommodated in other land use activities if feasible, but not to the extent of exclusion of other use needs. A feasible accommodation is one which is compatible with (does not make unobtainable) the major goals and/or objectives of other uses. When grizzly bear population and/or grizzly bear habitat use and other land use needs are mutually exclusive, the other land use needs will prevail in management considerations. If grizzly bear population and/or habitat use represents demonstrated needs that are so great (necessary to the normal needs or survival of the species or a segment of its population) that they should prevail in management considerations, then the area should be reclassified under Management Situation 1. Nuisance grizzlies will be controlled.

3. MANAGEMENT SITUATION 3

a. Population and habitat conditions

Grizzly bear presence is possible but infrequent. Developments, such as campgrounds, resorts or other high human use associated facilities, and human presence result in conditions which make grizzly bear presence untenable for humans and/or grizzlies. There is a high probability that major Federal activities or programs may affect the species' conservation and recovery.

b. Management Direction

Grizzly bear habitat maintenance and improvement are not management considerations. Grizzly-human conflict minimization is a high priority management consideration. Grizzly bear presence and factors contributing to their presence will be actively discouraged. Any grizzly bear involved in a grizzly-human conflict will be controlled. Any grizzly bear frequenting this area will be controlled.

C. RELATIONSHIP OF THE FLATHEAD NATIONAL FOREST HABITAT TO THE TOTAL ECOSYSTEM

The Flathead National Forest provides the largest single area of the habitat in the ecosystem. Encompassed within its boundaries is 37 percent of the habitat of the total ecosystem.

The following table describes the relationship of the Flathead National Forest to the total ecosystem. All landownerships are included.

TABLE E-1 Area Summary of the Northern Continental Div[illegible] Grizzly Bear Ecosystem - Flathead National Forest

Administrative Unit	Current Occupied Habitat Acres (Thousand)			
	Mgmt. Sit. 1	Mgmt. Sit. 2	Mgmt. Sit. 3	Total
National Forest				
Flathead	1923	112	21	2056
Helena	121	59	0	180
Lewis & Clark	764	5	7	776
Lolo	247	34	0	281
Kootenai	116	90	.4	207
Subtotal	3146	324	28	3500
National Park	1007	0	7	1014
Bureau of Land Management	24	0	0	24
Indian Reserve	-------Unstratified-------			362
State *	-------Unstratified-------			196
Private *	-------Unstratified-------			454
TOTALS	4177	324	35	5550

* Approximated Acres

TABLE E-2 Summary of the Capacity (Expressed in Number of Bears) for the Northern Continental Divide Grizzly Bear Ecosystem 1/ - Flathead National Forest

Admin. Unit	Estimated Population	Max. Potential	Recovery Goal	Alternatives 2/																		Benchmarks			
				1	2	3	4	5	6	CD 7	8	9	10	11	12	13	14	15	16	PA 17	MIN LVL	PNV	TMBR	RANGE	WLDLF
National Forest																									
Flathead	*	230-250	207	215	190	197	152	195	191	190	200	212	195	201	201	202	202	202	216	205	212	104	143	140	140
Helena	*	19-20	18	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Lewis & Clark	*	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
Lolo	*	14	22	11	14	14	13	11	13	12	14	14	11	14	13	13	14	14	14	14	14	14	14	14	14
Kootenai	*	13-16	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
National Park	200 3/	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Indian Reserves, State, and Private Lands	119 3/	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119	119
TOTAL	-	676-700	660 4/	658	636	643	597	638	636	634	646	658	638	647	646	647	648	648	662	651	658	630	589	586	586

1/ The capacity estimate is based on three sets of numbers:
   1. The recovery goal stated in the Recovery Plan.
   2. An extrapolation of current bear densities from research.
   3. Applied to each ownership according to percent control of the total ecosystem.

2/ Alternatives and Benchmarks were crosswalked where necessary using the objectives of the alternatives on the various forests.

3/ The estimated populations for other agencies and private lands were used as standard figures throughout the table. The capacity estimate for State, private and other Federal ownership is only an assessment of resource potential based on their percent ownership of the grizzly bear ecosystem. It does not constitute a management decision of how these lands should be managed.

4/ The Grizzly Bear Recovery Plan states a range for delisting of 440 to 680 bears that represents a viable and self-sustaining population documented over 6 years.

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* Forests are presently coordinating with the Montana Department of Fish, Wildlife, and Parks to estimate existing grizzly bear populations in their respective Forest Plans.

D. LIMITING FACTORS AND MANAGEMENT OPPORTUNITIES

Excessive human-caused mortality of grizzly bears and reduction in suitability and/or availability of grizzly bear habitat are the major factors which can limit grizzly bear recovery.

Land and resource management can influence these primary factors in several ways. Activities such as timber management and grazing can change the composition, distribution, and abundance of plant communities. Such changes affect the quantity and quality of food and cover for grizzlies. Human activity associated with uses such as timber management, recreation, mineral exploration and development can alter availability of habitat (space) to grizzly bears. Finally, various land uses with potential for grizzly/human conflicts can make grizzly bears vulnerable to human-caused mortality.

Land and resource uses may have positive, neutral, or negative effects upon grizzly bears and their habitat. The effect depends upon the type, location, and season of use relative to the desired ecological condition of the habitat and human activity in the area. Although individual uses may be well planned and not affect the grizzly bear or its habitat, the combined effect of several activities (over time and space) may be negative.

Habitat mapping and cumulative effects assessment are tools the land manager can use to identify opportunities for grizzly bear recovery actions.

Grizzly bears require timber cover for resting and hiding. They seem to prefer areas where there is an interspersion of open areas as feeding sites associated with timber cover.

Grizzly bears seek dens in the winter. They sometimes begin digging dens as early as September or may wait until late November just prior to entry. Dens are usually on steep slopes where wind and topography cause an accumulation of deep snow. Dens are normally found at higher elevations well away from any activity by humans.

E. FOREST RELATIONSHIP TO MORTALITY OBJECTIVES FOR THE ECOSYSTEM

In order to facilitate recovery, all Forests have target of 0 nonhunting grizzly bear mortalities. Many nonhunting bear losses could be prevented by inclusion and implementation of grizzly bear protection measures in: (a) leases, permits, contracts, and other authorizations affecting grizzly bears, and (b) activities conducted by the Forest Service in occupied grizzly bear habitat. Not all nonhunting mortality, however, is truely preventable. Examples are road kills and nuisance bear control. The Flathead National Forest's grizzly bear standards and guidelines would be applied in all alternatives to facilitate attainment of this target. All alternatives have the same acres of Management Situation 1, 2, and 3. Management emphasis will be placed on eliminating "preventable" mortalities.

The following tabulation documents the number of mortalities within the ecosystem:

GRIZZLY BEAR MORTALITY WITHIN THE NORTHERN CONTINENTAL DIVIDE ECOSYSTEM

(Data was obtained from the Preliminary Draft Grizzly Bear Programatic EIS, 1985, Montana Department of Fish, Wildlife, and Parks.)

	Time Period			
	1967 - 74 *		1975 - 84	
	Total	Annual Avg.	Total	Annual Avg.
Mortality (No. of Bears)				
Nonhunting	100	(12.5)	92	(9.2)
Hunting	126	(15.8)	106	(10.6)
Total	226	(28.3)	198	(19.8)

* Prior to listing under the Endangered Species Act.

F. GRIZZLY BEAR RECOVERY OBJECTIVES

The Flathead National Forest's objectives for meeting the Northern Continental Divide Ecosystem's recovery goal would be applied to all alternatives as follows:

1. Achieve the recovery goal for the Northern Continental Divide Ecosystem.
2. Manage all "Situation 1" areas with the grizzly bear as a primary resource which must be maintained or enhanced.
3. Manage "Situations 2 and 3" areas in a manner that multiple-use activities will be compatible with the conservation and recovery of the grizzly bear.

G. GUIDELINES AND MANAGEMENT DIRECTION

To assist land managers in meeting established goals for the grizzly bear, guidelines and specific Management Situation direction have been developed and would apply under all alternatives. These guidelines provide for more detailed application of the broad "Grizzly Bear Guidelines," for maintaining and improving habitat and in minimizing grizzly-human conflict potential.

It is recognized that in several geographic areas of the Forest, such as the Swan Valley, important seasonal habitats occur that are dependent on private as well as National Forest System land. Activities and programs on Forest land will be evaluated in relation to the importance of the area to the grizzly bear.

The guidelines and the Flathead National Forest annual monitoring plan will be reviewed with the U.S. Fish and Wildlife Service and the Montana Department of Fish, Wildlife, and Parks. The annual monitoring plan will provide rationale for stated levels of implementation of these guidelines.

To comply with Section 7 of the Endangered Species Act, biological evaluations consistent with these guidelines will be completed prior to projects being authorized or funded. The biological evaluation will determine the potential for the Preferred Alternative to adversely affect Federally listed species and provide recommended mitigation measures.

Appendix F. Comparison of Estimated Alternative Outputs and Activities to Selected RPA Objectives - Flathead National Forest

Output/Activity	RPA Objective	Alternative 1	2	3	4	5	6	7 CD	8	9
DEVELOPED RECREATION POTENTIAL		. . . . Thousand Recreation Visitor Days Per Year								
Decade 1 ---------------->	320.3	1030.7	1023.6	1030.7	965.4	1030.7	1023.6	1023.6	1030.7	1023.6
2	343.2	1030.7	1023.6	1030.7	965.4	1030.7	1023.6	1023.6	1030.7	1023.6
3	327.8	1030.7	1023.6	1030.7	965.4	1030.7	1023.6	1023.6	1030.7	1023.6
4	337.6	1030.7	1023.6	1030.7	965.4	1030.7	1023.6	1023.6	1030.7	1023.6
5	354.5	1030.7	1023.6	1030.7	965.4	1030.7	1023.6	1023.6	1030.7	1023.6
DISPERSED RECREATION POTENTIAL		. . . . Thousand Recreation Visitor Days Per Year								
Decade 1 ---------------->	597.3	1453.0	1575.5	1594.7	1258.7	1509.4	1600.4	1570.9	1672.5	1016.3
2	647.0	1453.0	1575.5	1594.7	1258.7	1509.4	1600.4	1570.9	1672.5	1016.3
3	702.0	1453.0	1575.5	1594.7	1258.7	1509.4	1600.4	1570.9	1672.5	1016.3
4	745.0	1453.0	1575.5	1594.7	1258.7	1509.4	1600.4	1570.9	1672.5	1016.3
5	773.9	1453.0	1575.5	1594.7	1258.7	1509.4	1600.4	1570.9	1672.5	1016.3
LIVESTOCK GRAZING USE		. . . . Animal Unit Months (AUM's) Per Year								
Decade 1 ---------------->	7848	4817	6418	6173	5747	5920	7183	6353	6223	6703
2	8000	4817	5708	5923	5747	5040	6133	6433	5933	6703
3	11000	4817	6418	6173	5747	5920	7313	6433	6223	6703
4	16000	4817	6418	6173	5747	5920	7803	6433	6223	6703
5	20000	4817	6418	6173	5747	5920	10663	6433	6223	6703
TIMBER-BASE HARVEST SCHEDULE		. . . . Million Board Feet Per Year								
Decade 1 ---------------->	118	82	116	101	51	82	145	132	100	103
2	120	98	119	105	86	99	134	122	103	97
3	135	115	145	129	151	115	149	167	127	106
4	149	130	161	141	175	129	170	143	137	125
5	167	151	177	160	176	151	175	161	166	146
REFORESTATION AREA		. . . . Acres Per Year								
Decade 1 ---------------->	3500	5100	6900	6200	3200	5000	8000	7600	6200	5600
2	2800	5100	6200	5700	4600	5100	7300	7100	5900	5000
3	2600	5400	6400	6100	6900	5300	6900	8600	6100	5200
4	2900	6300	7100	6300	8200	6500	9000	6100	6200	6900
5	3200	6500	7100	6100	7500	6000	7400	5900	6300	6700
TIMBER STAND IMPROVEMENT		. . . . Acres Per Year								
Decade 1 ---------------->	3450	2470	3980	3261	3770	2710	4199	4543	3613	3477
2	4540	2484	3533	3261	3770	2709	4199	4543	3613	3477
3	4770	5739	8526	6349	5463	6106	8436	7265	6974	7517
4	4890	4795	5976	5311	4508	5031	7237	6586	5282	4985
5	5110	4923	6365	5894	6906	5225	6940	7577	5946	5147

Appendix F. Comparison of Estimated Alternative Outputs and Activities to Selected RPA Objectives - Flathead National Forest

Output/Activity	RPA Objective	Alternative 10	11	12	13	14	15	16	17 PA	PNV
DEVELOPED RECREATION POTENTIAL	. . . . Thousand Recreation Visitor Days Per Year									
Decade 1 ----------------->	320.3	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1023.6
2	343.2	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1023.6
3	327.8	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1023.6
4	337.6	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1023.6
5	354.5	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1030.7	1023.6
DISPERSED RECREATION POTENTIAL	. . . . Thousand Recreation Visitor Days Per Year									
Decade 1 ----------------->	597.3	1208.0	1623.1	1584.3	1528.2	1464.5	1388.4	1122.5	1598.7	1394.4
2	647.0	1208.0	1623.1	1584.3	1528.2	1464.5	1388.4	1122.5	1598.7	1394.4
3	702.0	1208.0	1623.1	1584.3	1528.2	1464.5	1388.4	1122.5	1598.7	1394.4
4	745.0	1208.0	1623.1	1584.3	1528.2	1464.5	1388.4	1122.5	1598.7	1394.4
5	773.9	1208.0	1623.1	1584.3	1528.2	1464.5	1388.4	1122.5	1598.7	1394.4
LIVESTOCK GRAZING USE	. . . . Animal Unit Months (AUM's) Per Year									
Decade 1 ----------------->	7848	5920	6223	6223	6223	6223	6223	4817	6223	6703
2	8000	5040	5933	5933	5933	5933	5933	4817	5933	6703
3	11000	5920	6223	6223	6223	6223	6223	4817	6223	6703
4	16000	5920	6223	6223	6223	6223	6223	4817	6223	6703
5	20000	5920	6223	6223	6223	6223	6223	4817	6223	6703
TIMBER-BASE HARVEST SCHEDULE	. . . . Million Board Feet Per Year									
Decade 1 ----------------->	118	80	99	100	100	100	99	71	101	103
2	120	95	105	103	102	103	103	82	106	102
3	135	112	128	124	121	117	114	94	111	130
4	149	125	140	134	131	126	122	108	119	151
5	167	144	157	165	164	160	156	124	152	183
REFORESTATION AREA	. . . . Acres Per Year									
Decade 1 ----------------->	3500	4700	6400	6300	6200	6200	6200	4400	6600	5600
2	2800	5000	5900	5900	5900	5900	5900	4600	5700	5300
3	2600	5200	6000	5900	5800	5600	5500	4700	5600	5900
4	2900	6500	5900	6100	5900	5800	5600	5500	5200	6600
5	3200	5900	5800	6200	6200	6100	6000	5300	5600	6200
TIMBER STAND IMPROVEMENT	. . . . Acres Per Year									
Decade 1 ----------------->	3450	2691	3602	3594	3586	3463	3408	2244	3405	3317
2	4540	2691	3602	3594	3586	3463	3408	2244	3404	3317
3	4770	6695	6314	7013	6961	6894	6720	5879	5997	7517
4	4890	4937	5264	5295	5292	5307	4985	4432	5110	5260
5	5110	5221	5860	5829	5699	5563	5415	4665	5419	6432

APPENDIX G

1974 TIMBER MANAGEMENT PLAN DEFICIENCIES AND PROCEDURES TO CORRECT THEM - FLATHEAD NATIONAL FOREST

A. BACKGROUND

In May 1974, the Flathead National Forest issued an Environmental Impact Statement for an interim revision of the Timber Management Plan.

In October 1976, American Timber Co., Stoltze Lumber Co., Louisiana Pacific Corp., Rudolph B. Hoecker, George Stearns, Harold McLaughlin, and Richard G. Stearns filed civil complaint vs. the Secretary of Agriculture, U.S.F.S. Chief, Northern Region Regional Forester, and Flathead National Forest Supervisor alleging the Draft and Final "interim" Timber Management Plan EIS failed to adequately assess social, economic, and natural environmental consequences of the proposed Forest Plan, did not analyze and consider reasonable alternatives to the Forest Plan, and did not comply with the NEPA (National Environmental Policy Act).

On July 16, 1979, U.S. District Judge Russell Smith in Civil Action CV-76-115-M found the 1974 EIS was not proposed under the "procedures required by law" and held the 1974 TM (Timber Management) Plan was invalid.

On August 15, 1979, the Forest Service proposed to treat the areas the Court found deficient under NEPA in a "Forest Plan," developed under the auspices of the National Forest Management Act.

B. AREAS OF DEFICIENCY

In Judge Smith's opinion the following deficiencies needed to be corrected.

1. THE CHANGE IN THE STRATIFICATION OF THE LAND BASE

Sixty to eighty percent of the reduction in potential yield from the 1969 TM Plan to the 1974 proposal was due to a change in commercial Forest base. An additional 194,568 acres were placed in the high noncommercial Forest zone. This classification was done by a team of foresters and others with no documentation in the 1974 EIS for the reasons for the reduction of 118,034 acres from the 1969 commercial Forest base.

2. LENGTH OF CONVERSION PERIOD FOR REMOVAL OF OLD-GROWTH SAWTIMBER

The justifications for lengthening the conversion period from 34 years in the 1969 TM Plan to 42 or 50 years in the 1974 EIS were aesthetics, road costs, and watershed. The 1974 EIS stated the decision to change the conversion period was that the 34-year period specified in the 1969 TM Plan would cause the Forest to have a significantly modified visual appearance and that taxpayers couldn't afford road building costs necessary to cut old growth in that time period. The 1974 EIS set the conversion period at 42 years with a temporary lengthening to 50 years to allow for hydrologic stabilization with the understanding that adjustments would be made as more specific watershed information became available. The court found no analysis of tradeoffs, road construction costs, etc., in changing the conversion period to 42 years instead of 24 years. The temporary lengthening to 50 years was also faulted due to the blanket rather than separate watershed appraisal. In addition, conflicts of opinion among hydrologists were not dealt with.

3. MANAGED STANDS WOULD NOT YIELD AS MUCH AS HAD BEEN PROJECTED IN EARLIER PLANS

The 1974 EIS stated the basis for the yield projections was due to "improved information" but did not show what the information consisted of.

C. PROPOSED PROCEDURES TO DEAL WITH DEFICIENCIES

The following procedures have been used to address the deficiencies identified by the Court.

1. COMMERCIAL TIMBER LAND BASE

The major deficiency of the 1974 proposal was corrected through the Forest planning process by presenting and analyzing costs and benefits, and selecting from several land designation alternatives. The process for making the basic timber capability screen for the Forest Plan has been spelled out in a Flathead National Forest planning procedures document (219.12b dated 11/18/80). The process is analogous to the noncommercial Forest stratification for the 1974 TM Plan proposal. The criteria for classification of lands not suitable (noncommercial) of receiving consideration for timber management are plainly documented, and are measurable and mappable. The criteria are supported by scientific literature and experienced data.

2. LENGTH OF CONVERSION PERIOD

In previous timber management plans such as the 1969 and proposed 1974 revision, the major factors analyzed in determining alternative harvest levels were the length of conversion period for old growth and management intensities as reflected by yield projections. The Forest planning process deals not only with factors affecting growth, yield, and mortality. The major emphasis is on the economic consequences resulting from the interaction of management alternatives and biological growth and mortality. In Forest planning, the most cost effective combination of land designation, management intensities, and harvest schedule has been determined to achieve the objectives set for each alternative. Thus the rate of conversion of old growth is set for each stratification of the Forest necessary to achieve objectives and maximize economic benefits. Conversion of all old growth is no longer considered a given that is necessary or desirable to achieve in managing a Forest. Cutting of old growth or any other condition class has been scheduled with current analysis methods only to the extent that it is necessary and/or economically desirable. Evaluation of alternative conversion periods on old growth is not necessary under the integrated planning methodology. The ecological and social costs and benefits associated with old-growth timber quantity over time has been considered in structuring and evaluating alternatives.

3. MANAGED STAND YIELDS

Procedures for projected yields are documented by Flathead National Forest FORPLAN Timber Yield Coefficients. The procedures are well documented, referenced, and summarized in the Forest Plan EIS thus correcting the 1974 deficiency.